



Louisiana Department of Health and Hospitals
Office of Public Health
Center for Environmental Health

Louisiana BEACH Grant Report 2014 Swimming Season

**Submitted to U.S. Environmental Protection Agency
In Partial Fulfillment of Federal Assistance Agreement Number
CU-00F66501-0 for Development of Coastal Recreation Water Monitoring
and Public Notification**



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In cooperation with Louisiana Department of Health and Hospitals
Office of Public Health, Center for Environmental Health

January 2015

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2014 Swimming Season**

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Acknowledgements

Quantitative Ecological Services, Inc. (QES) wishes to thank Gordon Leblanc, Program Administrator, Molluscan Shellfish Program, Office of Public Health, Louisiana Department of Health and Hospitals (LDHH), Chris Lemaire, BEACH Program Manager, LDHH, and Caitlin L. Pinsonat and Ryan Farlow, Beach Monitoring Program Coordinators, LDHH, for their invaluable guidance and assistance during preparation of this report. Preparation of this document would not have been possible without the assistance, expert opinion and input of: Lance Broussard, Chief Sanitarian, Special Operations, Environmental Health Services, Tenney Sibley, Director of Sanitarian Services, LDHH, David Shane Burton, Office of Environmental Services, Louisiana Department of Environmental Quality (LDEQ), and Mike Schaub and Daniel Reid with the U.S. Environmental Protection Agency. LDHH also wishes to acknowledge the contributions of the Town of Grand Isle, the Cameron Parish Police Jury, Lafourche Parish Police Jury, Louisiana Office of State Parks, the City of Lake Charles, and the Lake Pontchartrain Basin Foundation for their contributions to successful program implementation during 2014.

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EXECUTIVE SUMMARY

This document was prepared to partially fulfill the Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services (CEHS) reporting obligations under U.S. Environmental Protection Agencies (USEPA) BEACH grant program, Federal Assistance Agreement Number CU-00F66501-0. Prior to publication of this report, the document was distributed to USEPA and the Louisiana Department of Environmental Quality for comments. The comments provided by both agencies were incorporated into this report. The report was made available to the public through CEHS's Beach Monitoring Program website (<http://new.dhh.louisiana.gov/index.cfm/page/288>).

As documented in *Louisiana's BEACH Grant Final Report – Grant Year 2001* (LDHH 2003; the Beach Report) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDHH 2014), CEHS is to submit an annual technical report to USEPA after the end of the recreational period that summarizes the number of beaches monitored in each Tier, lists any additional beaches to be added to the Program or Tier reassignments to be made in the next year, presents a compilation of sampling results, and summarizes assessment activities and response actions. The report is to also include for Tier 1 and 2 beaches, the number of beach monitoring stations for which advisories were issued, the number of times water quality criteria were exceeded and the number of days under advisories for each beach monitoring station. This report satisfies the reporting obligations set forth in the Beach Report and outlined above.

Beach use during 2014 approximates historical levels with two exceptions. Hackberry Beach (HACK1) in Cameron Parish, rendered inaccessible due to road damage by Hurricane Ike in 2008, remained inaccessible through the 2014 swim season. Public access to Fourchon Beach continued to be restricted during 2014 by a dispute over land ownership, with the ostensible private landowner denying public access to the beach area beyond the end of the public road. Accordingly, there was no public use of Fourchon Beach in 2014 and the beach was not monitored during 2014.

Between 1 April 2014 and 31 October 2014, a total of 753 samples were collected at 24 sample stations. Monitoring was initiated and conducted on schedule from the start of the monitoring season (1 April) through the end of the season (31 October). Twenty-four (24) sample stations were monitored at ten Tier 1 or 2 continuous beach segments with a total of 50 advisories issued. Advisories were issued at 23 of the 24 Tier 1 or 2 sample stations during 2014 based on observed water quality exceedances. There were no advisories issued at Grand Isle Beach 2 (GIB2). Compliance at stations with advisories varied between 96% of monitored days in compliance at Grand Isle Beaches 1 and 3 (GIB1 and GIB3), and Grand Isle State Park 4 (GISP4), to a low of 27% for Rutherford Beach (RUTH1). Across all monitored sample stations, 74% (3,232 of 4,392) of the 2014 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory. There were no beach closures issued in 2014 unlike in prior years when closures were issued for hurricanes and beach enrichment construction activities.

Advisories issued in 2014 resulted from exceedances of enterococci and fecal coliform criteria. The enterococci geometric mean criterion was exceeded in 157 of 181 (87%) observed

noncompliance weeks, with 107 (59%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 46 (25%) resulting from both enterococci geometric mean and single sample maximum exceedances, 3 (2%) resulted from exceedance of both enterococci and fecal coliform geometric mean criteria, and 1 (1%) resulting from exceedance of all criteria. Twenty-four (24; 13%) of the observed exceedances were the result of exceeding the single sample criterion alone. As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of monitored station-weeks that were in compliance is not directly comparable with other states that do not use equivalent decision criteria. If Louisiana's decision rule were based only on the enterococci single sample maximum criterion, the State would have failed to detect 61% of the observed noncompliance weeks during 2014. .

With each water sample collected by the BEACH Program, environmental variables were also collected. Using those data collected by the Program from 2004 through 2009, CEHS performed a thorough statistical analysis to examine how indicator organism density was influenced by environmental factors at Louisiana's coastal beaches (the 2009 analysis presented in the *Louisiana BEACH Grant Report, 2009 Swimming Season*). Consistent with previously reported analyses, the results of the 2009 analysis confirmed the following:

- There were no statistically meaningful differences among sample stations within continuous beach segments;
- Enterococci densities have changed from year-to-year at all beach segments except Fourchon (FOUR);
- There were no known controllable sources influencing the high enterococci densities at Cameron beaches;
- Environmental variables explained only a small fraction of the total variability in indicator organism density, and thus, statistical models of environmental variable-indicator organism relationships were not sufficient to be used as predictive models upon which precautionary advisories could be based.

Louisiana beaches are somewhat different from those of most coastal states in that they represent a wide range of salinity conditions and most are relatively remote from urban runoff, reducing the direct association between environmental conditions and enterococci densities. Given the water quality and environmental data collected by the Program through 2009, Louisiana BEACH Program managers believed development of models that could reliably predict enterococci densities were unlikely to be developed for Louisiana's beaches. However, a reexamination of the association between the available environmental variables and enterococci density was performed following the 2011 beach monitoring season because a significant amount of new data had been collected through the 2011 season. That analysis yielded the same conclusions as were drawn following the 2009 analysis. That is, year-to-year differences in enterococci density at all beach segments other than FOUR was a significant source of variation, and that for most beach segments, the relationship between the environmental variables and enterococci density changed from year to year. Additionally, the observed year-to-year variation in enterococci density was not explained by corresponding differences in the environmental variables.

Because of large year-to-year differences in enterococci densities and associated annual variance within beach segments, and annual differences in the relationship between enterococci density

and the environmental variables as shown in the 2011 Annual Beach Report, developing useful statistical models that go beyond describing general patterns of association between environmental conditions and enterococci densities may not be possible for Louisiana's more remote beaches. It may be possible to develop predictive models for the Lake Charles area beaches (Lake Charles North Beach [LCNB] and Lake Charles South Beach [LCSB]); the only urban beach segments currently monitored under Louisiana's BEACH Program, once additional monitoring data are available for model development and testing. For the remote beaches removed from major population centers, the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants.

During 2014, enterococci density was slightly greater than during 2013 at Fontainebleau State Park (FONT), Grand Isle Beach (GIB), Rutherford (RUTH), and Constance Beach Complex (CNSTBC). Enterococci density during 2014 was slightly less than during 2013 at Cypremort Point State Park (CYPT), but comparable to prior years at the remaining beaches.

Based on a year-end audit and data review, completeness goals for enterococci, fecal coliform and salinity were not met (94% complete versus 98% goal) due to lab handling problems and protracted sample holding times resulting in lab rejection of delivered samples. Of the 680 samples successfully processed, all results were considered valid and recorded in the Program's database. All processed samples had complete laboratory- and field-collected data. Because samples rejected by the lab due to protracted holding times were near the end of the swimming season, replacement samples were not collected. It is anticipated that LDHH's laboratory will be relocated from New Orleans to Baton Rouge prior to the start of the 2015 sampling period (1 April), reducing sample holding times, particularly for Cameron Parish beaches from which the 2014 rejected samples originated. No other variances from the QAPP were identified. All monitoring and notification data collected during 2014 have been uploaded to the appropriate USEPA data storage systems (STORET [<http://www.epa.gov/storet/>] and BEACON [<http://watersgeo.epa.gov/beacon2/about.html>]).

In preparation for the 2015 Beach monitoring season, the Program reassessed risk levels at monitored beaches and determined if any additional beaches warranted monitoring. Risk is a function of historical water quality conditions based on past Program sampling and beach use. Based on observed use levels and patterns during the 2014 swimming season and projections of use for the 2015 swimming season by Program partners, it is anticipated that use levels and patterns will remain at or return to approximately historical levels for all beaches except for the Hackberry and Fourchon Beaches. Hackberry Beach use is expected to remain limited during 2015 due to the continuing absence of adequate road access. Public access to Fourchon Beach is expected to remain restricted until the landownership dispute that restricted access during 2011-2014 is resolved or other arrangements to restore public access are negotiated. No additional beach segments were identified that warranted monitoring in 2015.

The anticipated use and historical water quality risk levels resulted in the 2015 monitoring season classification of seven continuous beach segments as Tier 1 beaches (Fontainebleau state Park, Elmer's Island [ELMR], Grand Isle and Cypremort Point State Parks, Holly [HOLLY], and North and South Beaches), three beach segments as Tier 2 (Grand Isle Beach, the Constance

Beach Complex, and Hackberry and Rutherford Beaches), and three Tier 3 beach segments (Fourchon, Fourchon-West, and Elmer's Island East). As in 2014, the Fourchon beach segments (FOUR1–FOUR3 and FOUR4) have been assigned to Tier 3 due to public access restrictions and will not be monitored in 2015. In 2015, it is anticipated that the Program will monitor 6.0 beach miles as Tier 1 beaches, 14.0 miles as Tier 2 beaches, and 0 miles of Tier 3 beach.

CHAPTER 1. Purpose, Background and 2014 Program Accomplishments

Purpose

According to *Louisiana's BEACH Grant Final Report – Grant Year 2001* (the Beach Report; LDHH 2003) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDHH 2014), the Louisiana Department of Health and Hospitals (LDHH), Office of Public Health (OPH), Center for Environmental Health Services (CEHS) is to submit an annual technical report to U.S. Environmental Protection Agency (USEPA) after the end of the recreational period. The report should accomplish the following: summarize the number of beaches monitored in each Tier, list any additional beaches to be added to the Program or Tier reassignments to be made in the coming year, provide a compilation of the sampling results, and summarize assessment activities and response actions. This report serves as the annual technical report for the 2014 recreational period and satisfies all of the requirements described above.

This document consists of four chapters. In this chapter, 2014 Program accomplishments are summarized. Chapter 2 contains a summary of the number of beaches that were monitored in each Tier, and a description of updates to Louisiana's BEACH Program, as anticipated under the Beach Report. Louisiana's BEACH Program updates include descriptions of 2014 Program modifications and changes to Tier assignments and beaches to be monitored under the Program in 2015. In Chapter 3, monitoring and response efforts and results for 2014 are provided. Data quality assessment results for the 2014 swimming season are presented in Chapter 4. Appendices A, B, and C contain station names and USEPA IDs, time series analyses of water quality data, and sample results, respectively. Appendix D provides a summary of how Louisiana's BEACH Program has fulfilled the original BEACH Grant requirements.

Background

In many ways, water could be considered Louisiana's greatest natural resource. Louisiana's vast estuarine basins provide a unique playground for swimming, wading, boating, fishing, and other aquatic activities. However, swimming in waters with high bacteria densities from fecal sources are a known threat to public health, causing elevated rates of gastrointestinal illness. LDEQ has historically conducted routine ambient monitoring of state coastal waters designated for primary contact recreation and utilized fecal coliform criteria to assess attainment of ambient water quality standards for swimming uses. However, there were no mechanisms in place to routinely sample water quality at "high-use" swimming waters, which had not been designated in state regulations by LDEQ, or to provide the public with the results of risk-based analyses that allow for an informed decision prior to swimming in selected coastal recreation waters.

In response to growing concern about public health risks posed by polluted bathing beaches, the U.S. Congress passed the BEACH Act in 2000. In 2001, the USEPA, under the provisions of the BEACH Act, made grant funds available to the OPH for the development of a monitoring and notification program for high-use coastal recreation sites, referred to as Louisiana's BEACH Program. Since initial grants were awarded, Louisiana's BEACH Program has been developed and successfully implemented under the guidance of the CEHS.

Consistent with USEPA's guidance, Louisiana's BEACH Program consists of two primary activities: monitoring and notification. Since bacteriological contaminants cannot be effectively monitored directly, monitoring for fecal contamination of surface waters requires the identification of indicator organisms that are associated with fecal contamination and readily monitored using available technologies. Like most other states, Louisiana has historically used fecal coliform densities as the indicator of bacteriological contamination of surface waters. However, under the terms of BEACH grant awards, states are required to base decisions about marine water quality at sites monitored using BEACH grant funds on enterococci bacteria densities. Enterococci have recently become generally accepted by the scientific community as more closely associated with rates of gastrointestinal illness in marine environments than fecal coliform densities, and thus USEPA believes that the use of enterococci may serve to better protect the public health in marine environments. However, because Title 51 Part XXIV of the Louisiana State Administrative Code ("Sanitary Code") stipulates the use of fecal coliform, Louisiana's BEACH Program chose to incorporate standards for both indicator organisms into its decision rule. The use of fecal coliform and enterococci as dual indicators of potential bacteriological contamination allows CEHS to better evaluate the presence of possible pathogens in Louisiana's unique coastal environment.

The second primary activity under the Program is public notification. Louisiana's BEACH Program issues public health advisories at Tier 1 and 2 monitored sites (tiers are defined in Chapter 2) when water quality samples are found to exceed the enterococci/fecal coliform criteria. The criteria used are a single sample maximum of 104 for enterococci, and steady state criteria based on geometric means of 35 for enterococci and 200 for fecal coliforms (quantities expressed as MPN/100 ml). The advisories urge users to abstain from swimming, but do not officially "close" the water body to recreational use. The Program disseminates swim advisories by press release, website postings, and by opening pole-mounted signs which are installed at the beach monitoring sites. When water quality sample results indicate that bacteria levels at beach sites under swim advisories are once again compliant with the decision rule, the public is notified that the advisory has been lifted through beach signage, press releases, and the website (<http://new.dhh.louisiana.gov/index.cfm/page/288>).

Program Accomplishments During 2014

During 2014, Hackberry Beach remained inaccessible due to prior hurricane related road damage, and access constraints due to an ownership dispute on Fourchon Beach and beach construction activities continued to restrict public access to the beach area. Accordingly, HACK1 and FOUR1–FOUR4 were not monitored during 2014.

During 2014, Louisiana's BEACH Program:

1. Monitored all accessible sample sites designated for monitoring in accordance with the requirements of their tier assignment throughout the swimming season; and
2. Continued to meet or exceed the majority of the quality assurance/quality control goals established in the Program's QAPP (LDHH 2014).

CHAPTER 2 - Update Of BEACH Program

Review of Beach Rankings

In 2003, the CEHS completed a systematic process to identify and rank Louisiana's beaches according to risk. The process consisted of the following steps (LDHH 2003):

1. Identification and definition of coastal recreation waters;
2. Identification of beaches or similar points of access used by the public for swimming, bathing, surfing, or similar water contact activities;
3. Review of available information on levels of potential fecal contamination at beaches and intensity of beach use; and
4. Ranking of beaches to decide which beaches would be included in Louisiana's BEACH Program.

Based on levels of beach use and perceptions of water quality from estimated fecal coliform densities in adjacent waters, a qualitative ranking scheme was devised and used to assign each beach to an appropriate monitoring tier. The monitoring tiers provide different levels of monitoring and public notification so that beaches with a greater density of swimmers, and thus the greatest number of people at risk, receive higher levels of monitoring and public notification than lower use beaches. Monitoring and public notification procedures are exactly the same at Tier 1 and Tier 2 beaches, but differ in density of sample stations. Sample stations are closer together at Tier 1 beaches, no more than 500 meters apart, than at Tier 2 beaches, where samples stations are no more than 2 miles apart on continuous beach segments. Sample stations at Tier 3 beaches are at the same density as Tier 2 beaches, but samples are not collected weekly, and accordingly, weekly public advisories are not issued for Tier 3 beaches.

The estimated number of swimmers at each beach was based on information obtained primarily from law enforcement officials responsible for patrolling the beach and from park managers. The officials provided estimates of the number of beach visitors on a typical weekday, weekend, and holiday during the peak swimming season, May 1 through Labor Day, along with an estimate of the percentage of beach users entering the water. These estimates were combined by adding typical weekday and weekend use to provide an estimate of weekly use. Weekly use was multiplied by the number of weeks in the recreational period, and added to the estimated number of holiday visitors during Memorial Day, Fourth of July, Labor Day, and any other beach-specific major events. Because the resulting total was an estimate of unknown precision, those estimates were generalized into broad categories of use for relative comparison as follows:

Category of Use	Estimated Number of Swimmers
Very Low	<5,000
Low	5,000 to <10,000
Moderate	10,000 to <15,000
High	15,000 to 20,000
Very High	>20,000

Because beach water quality was either inferred from the water quality of the surrounding area as a whole, or based on a short period of data, and no studies were available providing a model of the relationship between fecal coliform concentrations and illness rates, the qualitative ranking process relied primarily on beach use. Beaches classified as having very high, high, or moderate to high use were assigned to Tier 1 and receive the most monitoring attention. Beaches classified as having moderate use were assigned to Tier 2. Beaches with low or very low use were assigned to Tier 3 and targeted for additional bacterial indicator monitoring to better characterize risk. Beaches on private land or with existing swimming advisories posted by the State, and with very low public use were excluded from further consideration. A total of 29.16 miles of beach were considered for monitoring under Louisiana's BEACH Program, of which 23 miles have been assigned to a monitoring tier (LDHH 2003).

CEHS anticipated that beach use and water quality could change through time, and planned to re-evaluate beach rankings on an annual basis at the end of each swimming season (LDHH 2003). In 2006, it was decided that the Program would continue to evaluate risk primarily on the estimated density of swimmers at a beach in accordance with the original categories of use described above, but a new method of assessing water quality risk was developed. The original assessment evaluated water quality based on estimated fecal coliform densities. Data collected during 2004 and 2005 provided new information about water quality, including enterococci densities, which were not previously available. Because USEPA's chosen indicator organism for marine waters is enterococci, and because greater than 99.8% of all swim advisories issued to date have involved exceedance of enterococci criteria, new water quality categories based on enterococci densities were developed for use in the risk-based Tier assignment process.

A sample station's enterococci geometric mean density was strongly correlated with the percentage of monitored weeks under an advisory, so a sample station's geometric mean is a good indicator of the likelihood of exceeding the established limits of acceptable risk. Accordingly, water quality risk categories were based on the ratio of a beach's enterococci geometric mean divided by the enterococci geometric mean decision criterion of 35 MPN/100 ml. Water quality risk categories were established as: "Lower Risk" if the beach's geometric mean/35 < 0.5; "Moderate Risk" if the beach's geometric mean/35 \geq 0.5 and < 1; and "Higher Risk" if the beach's geometric mean/35 \geq 1. Using the revised classification scheme, continuous beach segments were assigned to Tiers at the beginning of 2014. Table 1 identifies the beaches that were monitored under the Program during 2014, their designated 2014 monitoring Tier, and associated sample stations.

Beach use during 2014 approximates historical levels with two exceptions. Hackberry Beach (HACK1) in Cameron Parish, rendered inaccessible due to road damage by Hurricane Ike in 2008, remained inaccessible through the 2014 swim season. Public access to Fourchon Beach continued to be restricted during 2014 by a dispute over land ownership, with the ostensible private landowner denying public access to the beach area beyond the end of the public road. Access to Fourchon beach was further restricted by the Caminada Headland Beach & Dune Restoration project. Accordingly, there was no public use of Fourchon Beach in 2014.

Table 1. Continuous beach segments, beach miles, monitoring Tier assignments for 2014 and 2015, and sample stations.

Continuous Beach Segments	Designated Beach Miles	First Year Sampled	2014 Designated Monitoring Tier	2014 Actual Monitoring Tier	2015 Designated Monitoring Tier	Sample Station State IDs*
Lake Pontchartrain Basin Beaches						
Fontainebleau State Park	0.13	2004	1	1	1	FONT1
Barataria River Basin Beaches						
Elmer's Island	0.31	2012	1	1	1	ELMR1
Elmer's Island-East	1.92	2012	3	3	3	ELMR2
Grand Isle State Park	1.03	2004	1	1	1	GISP1-4
Grand Isle Beach	6.20	2005	2	2	2	GIB1-3
Fourchon	0.88	2005	3	3	3	FOUR1-3
Fourchon-West	1.59	2005	3	3	3	FOUR4
Vermilion-Teche River Basin Beaches						
Cypremort Point State Park	0.47	2004	1	1	1	CYPT1
Calcasieu River Basin - Lake Charles Beaches						
North Beach - Lake Charles	0.42	2009	1	1	1	LCNB1
South Beach & Rabbit Island	0.23	2009	1	1	1	LCSB1
Calcasieu River Basin - Cameron Beaches						
Holly Beach	3.44	2005	1	1	1	HOLLY1-6
Mermentau River Basin Beaches						
Hackberry Beach and Rutherford Beach	2.40	2005	2	2	2	HACK1, RUTH1
Sabine River Basin Beaches						
Constance Beach Complex (CNSTBC)	6.29	2005	2	2	2	CNST1, DUNG1, GBRZ1, LTFL1, MART1

Note: * Sample station names and USEPA IDs are provided in Appendix A.

During 2014, seven continuous beach segments were designated as Tier 1 beaches and scheduled for monitoring (Grand Isle, Cypremort Point, and Fontainebleau State Parks; Elmer's Island, Holly Beach, and North and South Beaches in Lake Charles), and three continuous beach segments were designated as Tier 2 (Grand Isle Beach, Hackberry and Rutherford Beaches, and the Constance Beach Complex). Fourchon and Fourchon-West were scheduled to be monitored as Tier 3 beaches. All beach segments were monitored at their designated tier level during 2014 except for Fourchon, Fourchon-West and Hackberry Beaches. Sample stations FOUR1-FOUR4 and HACK1 were not monitored as scheduled due to access constraints described above. Elmer's Island East was not scheduled to be monitored during 2014 due to very-low usage and lower risk water quality.

In summary, during 2014, the Program monitored all 6.0 Tier 1 beach miles at the seven continuous Tier 1 beach segments, including sampling and public notification at all 15 of the Tier 1 sample stations (Table 2). Three continuous beach segments totaling 14.9 miles were

designated as Tier 2 beaches, of which 14.0 miles were monitored including sampling and public notification at 9 of the 10 sample stations (HACK1 was not monitored due to ongoing access constraints). Four Tier 3 sample stations on Fourchon (FOUR1-FOUR3) and Fourchon-West (FOUR4) were not monitored in 2014 due to access constraints, and Elmer's Island East (ELMR2) was not scheduled to be monitored resulting in 0 of 4.4 Tier 3 beach miles monitored.

Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2014 and planned for 2015.

	2014 (Actual)			2015 (Projected)		
	Tier 1	Tier 2	Tier 3	Tier 1	Tier 2	Tier 3
Number of Continuous Beach Segments	7	3	3	7	3	3
Number of Sample Stations	15	10	5	15	10	5
Total Beach Miles	6.0	14.9	4.4	6.0	14.9	4.4
Number of Continuous Beach Segments Monitored	7	3	0	7	3	0
Number of Sample Stations Monitored	15	9	0	15	9	0
Total Beach Miles Monitored	6.0	14.0	0	6.0	14.0	0

For the 2015 swimming season, as in past years, monitoring tier assignments were reviewed for all beaches based on expected use levels and historical water quality. It is anticipated that use levels and patterns will remain at approximately historical levels for all beaches except for the Hackberry and Fourchon beaches. Public access to the Fourchon and Fourchon-West beach segments is expected to remain restricted until the landownership issue is resolved or other arrangements to restore public access are negotiated.

Using water quality data pooled across sample stations within continuous beach segments, water quality risk categories were calculated for each continuous beach segment for use in establishing 2015 Tier assignments (Table 3). Two systems of water quality assessment were used, the Louisiana BEACH Program's beach risk classification, as described above, and the World Health Organization's (WHO) risk categorization system. The WHO's microbial water quality assessment criterion (WHO 2003) was applied to the last three years (2012–2014) of Louisiana's water quality data. In addition to water quality, the WHO classification system uses sanitary inspection categories to classify waters from very good to very poor, depending on the beach's susceptibility to fecal influence as determined by a sanitary survey, but only the microbial criterion was evaluated for the purposes of this report. Rather than rely on the annual enterococci geometric mean for its microbial criterion, the WHO uses the 95th percentile of observed enterococci densities over a longer term period, typically a minimum of three years, because it is easily understood and reflects much of the top-end variability in the distribution of water quality data that are of greatest public health concern and is robust against periodic variation in water quality. The WHO classifies water quality into four categories based on enterococci density (cfu/100 ml) and the associated risk of acquiring gastrointestinal illness as follows: A) <1 case in 100 exposures, 95th percentile ≤40 cfu/100 ml; B) between 1 and 5 cases in 100 exposures, 95th percentile 41-200 cfu/100 ml; C) between 5 and 10 cases in 100 exposures, 95th percentile 201-500 cfu/100 ml; and D) >10 cases in 100 exposures, 95th percentile >500 cfu/100 ml. For comparison, the USEPA's gastrointestinal illness rate

associated with the 1986 recommended enterococci criteria for marine recreational waters is 19 illnesses per 1,000 swimmers and the 2012 recommended enterococci criteria is 32-36 gastro intestinal illnesses per 1,000 swimmers, which would place it in WHO category B. To facilitate comparison with Louisiana's risk categories, we have categorized WHO classes A and B as lower risk, C as moderate, and D as higher risk.

Table 3. Beach water quality and use risk categories for 2014 swimming season based on anticipated use in 2015 and 2014 water quality data.

Beach	Anticipated 2015 Use	2014 Entero. Geometric Mean	2014 Entero. Geometric Mean / 35	2014 Water Quality Risk Cat.	Entero. 95th Parametric Percentile 2012-2014	WHO Risk Category
CNSTBC	Low	25.1	72%	Moderate	135	B
CYPT	Mod.-High	14.9	42%	Lower	233	C
ELMR	High	12.7	36%	Lower	90	B
FNTB	High	28.6	82%	Moderate	205	C
FOUR ¹	Very Low	33.3	95%	Moderate	89	B
GIB	Moderate	11.2	32%	Lower	49	B
GISP	Very High	15.1	43%	Lower	128	B
HACK-RUTH	Very Low	41.8	120%	Higher	324	C
HOLLY	Mod.-High	25.7	73%	Moderate	168	B
LCNB	Very High	23.7	68%	Moderate	186	B
LCSB	Very High	20.3	58%	Moderate	159	B

Notes: ¹ During 2014, Fourchon Beaches were not sampled; accordingly, 2013 results are presented.

In past years, water quality calculated using the Louisiana and the WHO risk categorization systems typically agreed closely. However, in 2014, those two categorizations were less in agreement, which can result from using different time periods (Louisiana's risk categorization uses only the prior year, where the WHO uses three years), and metrics (geometric mean versus 95th percentile). Using the modified WHO risk categorization results, eight continuous beach segments were classified in the lower water quality risk category (Constance Beach Complex, Elmer's Island, Fourchon and Grand Isle beaches, and Grand Isle State Park, Holly Beach, and North and South Beaches in Lake Charles), and three in the moderate risk category (Cypremort Point and Fontainebleau State Parks, and Hackberry and Rutherford Beaches). In contrast with the modified WHO categorization, Louisiana's risk categorization resulted in four continuous beach segments classified in the lower water quality risk category (Cypremort Point State Park, Elmer's Island, Fourchon, Grand Isle Beach and State Park), six in the moderate category (Constance Beach Complex, Fontainebleau State Park, Fourchon, Holly Beach, and North and South Beaches in Lake Charles), and one in higher category (Hackberry-Rutherford Beach).

Combined 2014 use and water quality rankings for each continuous beach segment are given in Table 4. As discussed above, tier categories remain based on the same swimmer density categories that were used in the original tier designation system, but low and very low use categories are designated as "Discretionary." For "Discretionary" beach segments, the Louisiana

BEACH Program Manager will decide if Tier 2 or 3 level monitoring is warranted at any time during the monitoring season. Because of the moderate water quality risk at Constance Beach Complex and higher risk at Hackberry and Rutherford Beaches, it is anticipated that they will remain Tier 2 beaches during 2015. The 2014 beach tier assignments are expected to remain in place for 2015 as shown in Table 1. As in 2014, the Fourchon beach segment (FOUR1–FOUR3) has been assigned to Tier 3 due to public access restrictions and will not be monitored during 2015. Similarly, Elmer’s Island East (ELMR2) will not be monitored during 2015 due to continued very-low use and lower-risk water quality. Therefore, the Program is expected to monitor all Tier 1 beaches totaling 6.0 beach miles, 14.0 of 14.9 Tier 2 beach miles, and 0 of 4.4 Tier 3 beach miles (Table 2) in 2015.

Table 4. Combined beach use and water quality risk categories for 2015.

		Water Quality Risk ¹ =►				
▲ # of Swimmers		Lower Risk	Moderate Risk	Higher Risk	Unknown	
	VH	GISP	LCNB, LCSB			Tier 1
	H	CYPT, ELMR1	FNTB, HOLLY			
	M	GIB				Tier 2
	L		CNSTBC ²			Tier3
	VL	ELMR2 ³	FOUR1-FOUR3, & FOUR4 ⁴	HACK-RUTH ⁵		
		Discretionary				

Notes: ¹Water quality risk level based on 2012-2014 data using WHO classification. ²CNSTBC will be monitored as tier 2 beaches during 2015. ³ELMER2 will not be monitored in 2015 because very low use and Lower Risk water quality. ⁴Use at Fourchon Beach (FOUR1-FOUR4) during 2015 is expected remain restricted due to public access constraints and will not be monitored. ⁵HACK-RUTH will be monitored as a tier 2 beach during 2015, although no sampling of HACK1 is expected due to access constraints.

In addition to annually re-evaluating risk levels and associated tier designations for beach segments monitored during the previous year, the program determines if any additional beaches warrant monitoring. No additional beaches were identified for inclusion under the Program.

Program Modifications

No modifications were made to the Program’s procedures, methods or decision rule during 2014. The Program followed the procedures, methods and decision rule summarized in *Louisiana’s BEACH Program Quality Assurance Project Plan, Version 2.f*, which is available on the World Wide Web at <http://new.dhh.louisiana.gov/index.cfm/page/288>.

Louisiana currently uses both 30-day running geometric mean (GM) criteria, and a single sample maximum (SSM) criterion. GM criteria consist of a fecal coliform criterion (cannot exceed 200 MPN/100 mL) and an enterococci criterion (cannot exceed 35 MPN/100 mL). The SSM criterion is exceeded if the density of enterococci is greater than 104 MPN/100 mL (75th percentile of a log-normal distribution with geometric mean = 35 and log₁₀ st. dev. = 0.7).

Exceedance of any criterion results in the beach being classified as “out of compliance” and an advisory issued.

In 2015, fecal coliform criterion will be eliminated from Louisiana’s notification decision criteria. Based on a retrospective analysis of 5,562 station-weeks and associated advisory decisions, the fecal coliform GM criterion was exceeded only 35 times. However, all but 4 of the 2,179 advisories during those weeks ($< 0.2\%$) exceed one or more of the enterococci criteria. Accordingly, elimination of the fecal coliform criterion will not compromise the Program’s public health protection objective but will result in cost savings.

CHAPTER 3. Louisiana BEACH Program's 2014 Results

Number of Samples Collected

Between 1 April 2014 and 31 October 2014, a total of 753 samples were collected at 24 sample stations (see Table 5), distributed among four sample types: field duplicates and splits, resample, and routine samples. Each type of sampling is described below.

Table 5. Total number of samples collected by sample station and sample type during 2014 by Louisiana's BEACH Program.

Sample Station	Sample Type				Station Total
	Field Duplicate	Field Split	Resample	Routine	
CNST1	1	3	0	28	32
CYPT1	0	2	0	28	30
DUNG1	1	0	0	28	29
ELMR1	0	1	0	29	30
FNTB1	1	5	0	28	34
GBRZ1	0	1	0	28	29
GIB1	1	0	0	29	30
GIB2	0	2	0	29	31
GIB3	1	3	0	29	33
GISP1	1	1	0	29	31
GISP2	1	3	0	29	33
GISP3	3	5	0	29	37
GISP4	3	1	0	29	33
HOLLY1	2	2	0	28	32
HOLLY2	0	2	0	28	30
HOLLY3	2	2	0	28	32
HOLLY4	0	2	0	28	30
HOLLY5	4	2	0	28	34
HOLLY6	0	1	0	28	29
LCNB1	1	0	0	28	29
LCSB1	1	0	0	28	29
LTFL1	0	4	0	28	32
MART1	3	2	0	28	33
RUTH1	1	2	0	28	31
Sample Type Total	27	46	0	680	753

Routine samples are the regularly scheduled weekly samples collected during the designated monitoring period at beaches that are officially part of the Program. A total of 680 routine samples were collected across 24 sample locations monitored in 2014. Resamples are collected at the BEACH Program Manager's discretion when a routine sample has an unexpectedly high indicator organism density or when the source of an exceedance is known and has been corrected and extra samples are required to calculate a post-event geometric mean. There were no resamples collected during 2014.

Field duplicates and field splits are two types of quality control (QC) samples. Field duplicates were used to estimate the precision of sampling methods by comparing laboratory results for two samples taken consecutively on the same day at the same sampling site (i.e., one grab is considered the routine sample or resample and the other the QC sample). Field splits were used to estimate the precision of laboratory analyses (intra-laboratory) plus any variability induced during sample handling and transport by analyzing two aliquots of the same water sample (i.e., one-half of the split sample is considered the routine sample or resample and the other half the QC sample), which were subdivided in the field. Louisiana's BEACH Program QAPP requires that approximately 10% of scheduled sample events be designated as quality control samples, which are selected at random at the beginning of the sampling period in approximately equal proportions ($\approx 5\%$ each) of field duplicate and field split samples. QC samples may also be collected during resample events to improve the precision of estimated indicator organism densities by averaging resample and QC sample results. A total of 75 QC samples were scheduled to be collected concurrent with the 720 routine samples, and were to consist of 30 field duplicates and 45 field split samples. Of the 720 scheduled routine samples, 680 were collected (94.4%), with 40 station-weeks missed due to lab problems and protracted sample holding times resulting in lab rejection of delivered samples. For the stations-weeks with sample results, 71 QC samples were scheduled (27 field duplicates and 44 field split samples). A total of 27 field duplicates and 46 field split samples were collected during 2014. Twenty-five (25) field duplicates were sampled as scheduled (93%), and 43 field split samples were collected as scheduled (98%), resulting in 96% of scheduled QC samples collected. Two unscheduled field-duplicates and one unscheduled field-split sample were collected, resulting in a total of 27 field duplicate and 46 field split quality control samples collected, achieving 100% of the QC sample goal.

Of the 753 total samples, all were collected during the designated monitoring period, and those collected at Tier 1 and 2 beaches were used to make weekly water quality decisions. For analysis purposes, samples collected on the same date at the same location were not considered independent, and were averaged together (i.e., arithmetic mean) resulting in a total of 680 independent samples collected during the 2014 designated monitoring season (see Table 6).

Summary Statistics for 2014 Designated Monitoring Period Samples

Results of fecal coliform and enterococci densities (MPN/100ml) and salinity (parts per thousand; ppt) for each sample location during the 2014 designated monitoring period are summarized in Table 7, and those summaries are depicted graphically in Figures 1 through 3. Because indicator organism densities are lognormal distributed, Table 7 presents \log_e mean and

\log_e standard deviations; exponentiation of the \log_e mean produces the geometric mean on the nominal scale. Note that \log_e fecal coliform and \log_e enterococci medians shown in the graphs and \log_e means in Table 7 are approximately equal as would be expected for lognormal distributed populations.

Figures 1 and 2 show the distribution of \log_e fecal coliform and \log_e enterococci densities (MPN/100ml), respectively, by sample station and relative to the decision criteria for samples collected during the 2014 designated monitoring season. The relationship between fecal coliform and enterococci densities is not examined in this report as a rigorous statistical analysis of that relationship was presented in the *Louisiana BEACH Grant Report, 2007 Swimming Season*. That analysis concluded that although the relationship between fecal coliform and enterococci was positive (higher levels of enterococci are associated with higher levels of fecal coliform), predicting enterococci density from historical fecal coliform data is difficult and imprecise, due in part to the differences in salinity among sample stations as shown in Figure 3.

Table 6. Number of independent samples collected by sample station during the 2014 monitoring season (1 April – 31 October). Samples collected at the same station on the same day are counted as a single sample.

Sample Station	Number of Samples
CNST1	28
CYPT1	28
DUNG1	28
ELMR1	29
FNTB1	28
GBRZ1	28
GIB1	29
GIB2	29
GIB3	29
GISP1	29
GISP2	29
GISP3	29
GISP4	29
HOLLY1	28
HOLLY2	28
HOLLY3	28
HOLLY4	28
HOLLY5	28
HOLLY6	28
LCNB1	28
LCSB1	28
LTFL1	28
MART1	28
RUTH1	28
Totals	680

Table 7. Summary statistics for fecal coliform and enterococci density (MPN/100ml), and salinity for samples collected during the 2014 designated monitoring season by sample station.

State ID	Fecal Coliform			Enterococci			Salinity (ppt)		n
	Geo. Mean	Log _e Mean	Log _e St. Dev.	Geo. Mean	Log _e Mean	Log _e St. Dev.	Mean	St. Dev	
CNST1	8.9	2.18	1.55	28.9	3.36	1.55	24.0	4.45	28
CYPT1	19.7	2.98	1.39	14.9	2.70	1.41	3.0	1.68	28
DUNG1	7.1	1.96	1.25	27.7	3.32	1.52	24.1	4.43	28
ELMR1	5.1	1.62	1.36	12.7	2.54	1.28	24.1	5.58	29
FNTB1	47.6	3.86	1.90	28.6	3.35	1.47	1.5	0.87	28
GBRZ1	7.1	1.96	1.28	23.7	3.16	1.49	24.0	4.42	28
GIB1	9.5	2.25	1.59	11.6	2.45	0.98	22.6	5.97	29
GIB2	7.1	1.96	1.23	13.0	2.57	1.10	23.0	5.90	29
GIB3	3.7	1.31	0.89	9.4	2.24	0.99	23.0	5.72	29
GISP1	15.4	2.74	1.55	12.5	2.53	1.28	20.5	5.26	29
GISP2	21.0	3.05	1.70	15.5	2.74	1.32	21.1	5.17	29
GISP3	19.9	2.99	1.86	17.0	2.83	1.46	21.4	5.30	29
GISP4	18.4	2.91	1.71	15.5	2.74	1.35	21.5	5.50	29
HOLLY1	8.8	2.17	1.39	22.0	3.09	1.45	23.2	4.77	28
HOLLY2	11.1	2.41	1.50	23.5	3.16	1.40	23.2	4.75	28
HOLLY3	12.0	2.49	1.41	31.1	3.44	1.41	23.2	4.85	28
HOLLY4	11.2	2.42	1.66	23.7	3.16	1.36	23.2	4.86	28
HOLLY5	10.1	2.31	1.22	27.8	3.32	1.32	23.3	4.77	28
HOLLY6	10.9	2.39	1.60	27.4	3.31	1.46	23.4	4.80	28
LCNB1	39.1	3.67	1.50	23.7	3.17	1.45	3.6	2.35	28
LCSB1	24.8	3.21	1.74	20.3	3.01	1.52	6.3	3.73	28
LTFL1	6.0	1.80	1.16	20.0	3.00	1.38	24.1	4.47	28
MART1	5.5	1.71	1.20	26.3	3.27	1.47	24.2	4.30	28
RUTH1	8.2	2.11	1.17	41.8	3.73	1.42	21.9	5.43	28

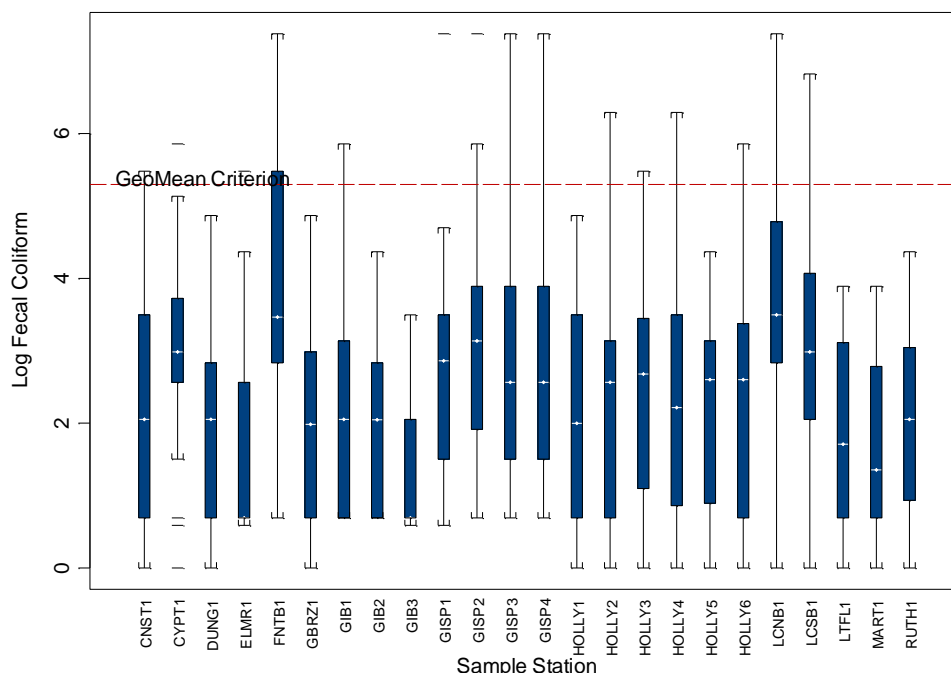


Figure 1. The distribution of \log_e transformed fecal coliform densities (MPN/100ml) by sample station relative to the geometric mean criterion for samples collected during the 2014 designated monitoring season. The box represents the inner quartile range (25th to 75th percentiles), and upper and lower whiskers extending from the box represent the smallest and largest observations within one step (1.5 times inner quartile range). The median (\diamond) is marked by a line through the box, and horizontal bars (—) represent extreme values.

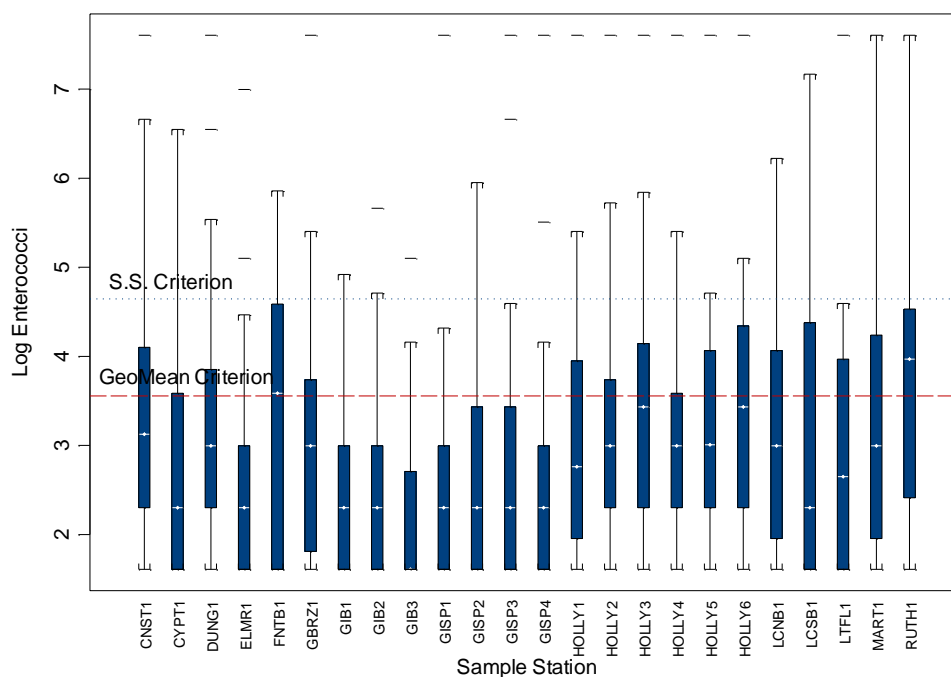


Figure 2. The distribution of \log_e transformed enterococci densities (MPN/100ml) by sample station relative to geometric mean and single sample maximum criteria for samples collected during the 2014 designated monitoring season.

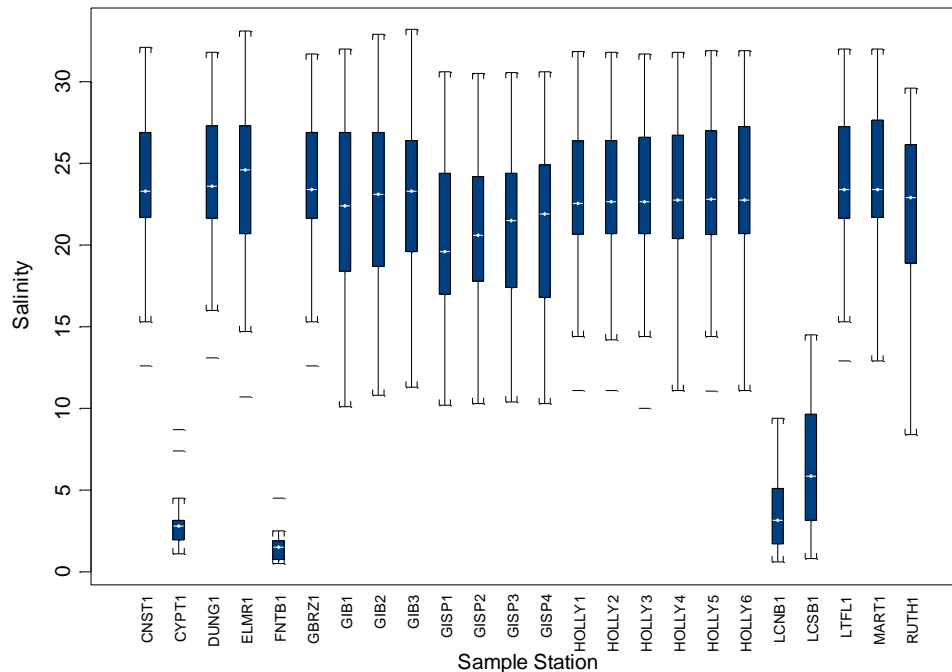


Figure 3. The distribution of salinity (ppt) by sample station for samples collected during the 2014 designated monitoring season.

Time-Series of 2014 Designated Monitoring Period Samples

In addition to calculating summary statistics for each sample station over the 2014 designated monitoring period, results are presented as a time-series (Appendix B, Figures B.1 through B.24; data for each sample event is provided in Appendix C). Because sample results were used during the designated monitoring season to make weekly determinations of whether or not water quality at each sample station met the Program's water quality criteria for Tier 1 and 2 beaches, sample results and the running 30-day geometric mean are shown in the figures. In each week, the last enterococci sample of the week and the running 30-day geometric mean for enterococci and fecal coliform must both be less than or equal to their respective criterion for the sample station to be classified as in compliance. If any criterion was exceeded, the sample station was classified as not in compliance and a swimming advisory was issued. The advisory remained in effect until the most recent sample results and the running geometric means were all less than or equal to their respective criterion.

Weekly Decision Rule Outcomes

During the 2014 swimming season (1 May – 31 October), 24 sample stations were monitored at ten Tier 1 or 2 continuous beach segments with a total of 50 advisories issued. Advisories were issued at 23 of the 24 Tier 1 or 2 sample stations during 2014 based on observed water quality exceedances (see Tables 8 and 9). There were no advisories issued at GIB2. Compliance at stations with advisories varied between 96% of monitored days in compliance at GIB1, GIB3,

and GISP4, to a low of 27% for RUTH1. Across all monitored sample stations, 74% (3,232 of 4,392) of the 2014 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory. No beach closures were issued in 2014 unlike in prior years when closures were issued for hurricanes and beach enrichment construction activities.

Advisories issued in 2014 resulted from exceedances of enterococci and fecal coliform criteria (Table 10). The enterococci geometric mean criterion was exceeded in 157 of 181 (87%) observed noncompliance weeks, with 107 (59%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 46 (25%) resulting from both enterococci geometric mean and single sample maximum exceedances, 3 (2%) resulted from exceedance of both enterococci and fecal coliform geometric mean criteria, and 1 (1%) resulting from exceedance of all criteria. Twenty-four (24; 13%) of the observed exceedances were the result of exceeding the single sample criterion alone. As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of monitored station-weeks that were in compliance is not directly comparable with other states that do not use equivalent decision criteria. If Louisiana's decision rule was based only on the enterococci single sample maximum criterion, the State would have failed to detect 61% of the observed noncompliance weeks during 2014.

When exceedances of water quality criteria were detected, an advisory was issued. To notify the public that a swimming advisory was in effect, the BEACH Program's monitoring/advisory sign at the sample site was opened, a press release was issued, and notice of the advisory was placed on the OPH BEACH website (<http://new.dhh.louisiana.gov/index.cfm/page/288>).

Table 8. Advisory history by sample station and week for beach segments designated and monitored as either Tier 1 or Tier 2 beaches during the 2014 swimming season.

Station ID	Advisory Condition as of Friday for Each Week - 2014 Swimming Season																									
	May				June				July				August					September				October				
	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	5	12	19	26	3	10	17	24	31
CNST1								A	A	A	A	A	A	A	A	A	A	A								
CYPT1	A	A	A	A																						
DUNG1							A	A	A	A	A	A		A	A	A										
ELMR1								A			A	A		A												
FNTB1	A	A	A	A		A	A				A						A	A						A		
GBRZ1								A	A	A	A	A	A	A	A	A										
GIB1																					A					
GIB2																										
GIB3				A																						
GISP1								A	A	A		A														
GISP2	A	A						A																		
GISP3								A	A	A	A	A														
GISP4								A																		
HOLLY1								A	A	A	A	A	A	A	A											
HOLLY2	A						A	A	A	A	A	A	A	A	A											
HOLLY3		A					A	A	A	A	A	A	A	A	A	A										
HOLLY4							A	A	A	A	A	A														
HOLLY5	A							A	A	A	A	A	A	A	A	A										
HOLLY6		A					A	A	A	A	A	A	A			A										
LCNB1			A						A		A	A	A	A	A			A								
LCSB1								A				A		A		A		A				A				
LTFL1								A	A	A	A	A	A		A											
MART1		A		A				A	A	A	A	A	A													
RUTH1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		A						

Notes: “A” indicates an advisory was put in place or remained in effect at the beach based on observed water quality data. FOUR1-FOUR4, and HACK1 are not shown as they were not sampled in 2014 due to access constraints.

Table 9. Summary of 2014 advisories and closures.

State ID	Days Under Closure	% of Station-Days Under Closure	Days Under Advisory	% of Season Under Advisory	Days Under Closure or Advisory	% of Season Under Closure or Advisory	% of Available Season Open & In Compliance
CNST1	0	0%	77	42%	77	42%	58%
CYPT1	0	0%	28	15%	28	15%	85%
DUNG1	0	0%	65	36%	65	36%	64%
ELMR1	0	0%	29	16%	29	16%	84%
FNTB1	0	0%	69	38%	69	38%	62%
GBRZ1	0	0%	64	35%	64	35%	65%
GIB1	0	0%	7	4%	7	4%	96%
GIB2	0	0%	0	0%	0	0%	100%
GIB3	0	0%	7	4%	7	4%	96%
GISP1	0	0%	30	16%	30	16%	84%
GISP2	0	0%	20	11%	20	11%	89%
GISP3	0	0%	35	19%	35	19%	81%
GISP4	0	0%	7	4%	7	4%	96%
HOLLY1	0	0%	55	30%	55	30%	70%
HOLLY2	0	0%	69	38%	69	38%	62%
HOLLY3	0	0%	77	42%	77	42%	58%
HOLLY4	0	0%	42	23%	42	23%	77%
HOLLY5	0	0%	71	39%	71	39%	61%
HOLLY6	0	0%	63	34%	63	34%	66%
LCNB1	0	0%	50	27%	50	27%	73%
LCSB1	0	0%	60	33%	60	33%	67%
LTFL1	0	0%	46	25%	46	25%	75%
MART1	0	0%	54	30%	54	30%	70%
RUTH1	0	0%	133	73%	133	73%	27%
Totals	0	0%	1158	26%	1158	26%	74%

Notes: FOUR1-FOUR4 and HACK1 are not included in this table because they were not monitored in 2014 due to access constraints.

Table 10. Summary of weekly decision rule exceedances by cause for 2014.

Cause of Exceedance	Number of Observed Exceedances	% of Observed Exceedances
Only fecal coliform geometric mean criterion exceeded	0	0%
Only Enterococci geometric mean criterion exceeded	107	59%
Only Enterococci single sample max criterion exceeded	24	13%
Both Enterococci geometric mean and single sample max criteria exceeded	46	25%
Both Enterococci and fecal coliform geometric mean criteria exceeded	3	2%
Both Enterococci SS max and fecal coliform GM criteria exceeded	0	0%
All criteria exceeded	1	1%
Total	181	100%

Relationship between Indicator Organisms and Environmental Conditions

Louisiana's BEACH Program uses both fecal coliform and enterococci as indicator organisms in its decision rule to determine beach water quality compliance. Enterococci are used because recent studies have shown that they perform better than fecal coliform in marine waters as they are more closely correlated with gastroenteritis rates (see USEPA 2002 for a review of indicator organisms). Fecal coliform was included in Louisiana's BEACH Program's decision rule primarily because it is specified in the state's Sanitary Code (LAC 51:XXIV §909.B) and Water Quality Standards (LAC 33:IX §1113.5.a) as the indicator organism for determining water quality in natural waters. Secondly, fecal coliform was included because all historical bacteriological water quality data collected by the State, other than under the BEACH Program, consists of fecal coliform densities.

In order to associate historical patterns of water quality with current patterns based on enterococci densities, the relationship between fecal coliform and enterococci densities was examined in previous BEACH Reports. A rigorous statistical analysis of the relationship between fecal coliform and enterococci densities was presented in the *Louisiana BEACH Grant Report, 2007 Swimming Season*. Through that analysis we learned that although the relationship between fecal coliform and enterococci was positive (higher levels of enterococci are associated with higher levels of fecal coliform), it varied among continuous beach segments by year and required adjustment for the effects of water temperature. Accordingly, it was concluded that the relationship is quite complex, making the prediction of enterococci density from historical fecal coliform data complex and imprecise.

Of greater interest than the relationship between indicator organisms is how the density of indicator organisms is influenced by environmental factors. Knowing the influence of environmental factors on indicator organism densities can help identify possible sources of elevated bacteria and is required to develop predictive models, which USEPA has encouraged. Predictive models are used to predict when water quality standards are likely to be exceeded based on readily observable conditions, and provide a basis for issuing precautionary advisories. Issuance of precautionary advisories could supplement the current sample result-based advisory process, overcoming the limitations from the poor relationship in day-to-day indicator organism densities in natural waters and the protracted time between sample collections and obtaining results. Because greater than 98% of advisories issued from the Program's inception in 2004 through 2014 involved exceedance of enterococci criteria, investigation of the influence of environmental factors on indicator organism densities has focused on enterococci. More specifically \log_e transformed enterococci density was examined because the majority of exceedances under the Program involved exceedance of the enterococci geometric mean criterion and because enterococci densities are log-normally distributed.

With each water sample collected by the BEACH Program, environmental variables were also collected, including surface water temperature (°F), salinity (ppt), tide conditions, weather conditions, and wind direction and speed. Total precipitation (in.) 0–24 hrs (precip0), 24–48 hrs (precip1), 48–72 hrs (precip2), and 72–96 hrs (precip3) prior to sample collection were estimated using rain basin precipitation values taken from Louisiana's Molluscan Shellfish database. Rain basin daily precipitation was estimated by averaging observed precipitation at

rain gauges within the rain basin, and beaches were assigned to the rain basin in which they occurred. The number of days between sample collection and the most recent prior day with a precipitation record > 0 (DaysSinceLastRain) was estimated, and daily precipitation estimates were summed into measures of total precipitation within 0–48 hrs (precip48) and 0–72 hrs (precip72) prior to sample collection.

Using the observed environmental variables, estimated precipitation values and the associated \log_e transformed enterococci densities collected by the Program from 2004 through 2009, CEHS performed a thorough statistical analysis to determine how indicator organism density was influenced by environmental factors at Louisiana's coastal beaches (the 2009 analysis). Note that for that analysis, sample stations at Fourchon and Fourchon-West were considered to be from a single contiguous beach segment, Fourchon Beach (FOUR), because of the similarities among values observed at the segments. To facilitate the analysis, the number of categories for tide, weather, and wind direction and speed were reduced, which also eliminated categories with few observations. The nine Tide categories (high, high falling, low, low falling, normal, high rising, low rising, extremely low, and extremely high) were used to create a new variable, TideHNL, consisting of three categories (high, normal and low). Similarly, the eight Weather categories (clear, scattered clouds, partly cloudy, cloudy, mist, fog, light rain, and rain) were used to create the new two-category variable, Sunny (under clear conditions Sunny = 1 else 0). The 18 WindDirection categories (the 4 cardinal and 12 ordinal directions plus calm and variable) were transformed to WindDirNSEW consisting of five categories (N, S, E, W and calm). The six Wind speed categories (0 mph, plus five categories of 5 mph increments starting at 0-5 mph) were transformed to a continuous variable, "numeric WindSpeed."

The results of the 2009 analysis confirmed the findings of previous reported analyses that there were no statistically meaningful differences among sample stations within continuous beach segments (StateID explains almost none of the variation in enterococci density), and that enterococci densities have changed from year to year (Year) at all beach segments except Fourchon, which has remained stable. The complete results of the 2009 analysis were reported in the *Louisiana BEACH Grant Report, 2009 Swimming Season*, which concluded that:

"given the available data, it is unlikely that models that can reliably predict enterococci densities can be developed for Louisiana's beaches. Different environmental factors are most correlated with enterococci density for different beach segments and area groups, and no single environmental factor is useful in predicting indicator organism density. It also appears that the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants. Better measurement of the environmental variables that are currently being collected and/or collection of additional environmental measures may be required to adequately predict water quality from observable environmental conditions. Louisiana beaches are somewhat different from those of most coastal states in that they represent a wide range of salinity conditions and most are relatively remote from urban runoff, reducing the direct association between environmental conditions and enterococci densities."

Through 2011, a total of 5,164 independent¹ samples were collected; 1,555 samples beyond those available in 2009. Given the additional data available, the analysis was repeated and yielded the same conclusions as were drawn following the 2009 analysis. That is, year-to-year differences in enterococci density at all beach segments other than FOUR was a significant source of variation, and that for most beach segments, the relationship between the environmental variables and enterococci density changed from year to year. Additionally, the observed year-to-year variation in enterococci density was not explained by corresponding differences in the environmental variables.

Because of large year-to-year differences in enterococci densities and associated annual variance within beach segments, and annual differences in the relationship between enterococci density the environmental variables as shown in the 2011 Annual Beach Report, developing useful statistical models that go beyond describing general patterns of association between environmental conditions and enterococci densities may not be possible for Louisiana's more remote beaches. It may be possible to develop predictive models for the Lake Charles area beaches (LCNB and LCSB); the only urban beach segments currently monitored under Louisiana's BEACH Program, once additional monitoring data are available for model development and testing. For the remote beaches removed from major population centers, the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants.

Figure 4 shows the considerable annual variation in enterococci densities within beach segments from Program inception through 2014. Enterococci density during 2014 was slightly greater than during 2013 at Fontainebleau State Park, Grand Isle Beach, Rutherford, and Constance Beach Complex. Enterococci density during 2014 was slightly less than during 2013 at Cypremort Point State Park, but comparable to prior years at the remaining beaches.

¹ For analysis purposes, single samples collected on a date at a sample location were considered independent; multiple samples collected on a date at a sample location were averaged together and considered independent.

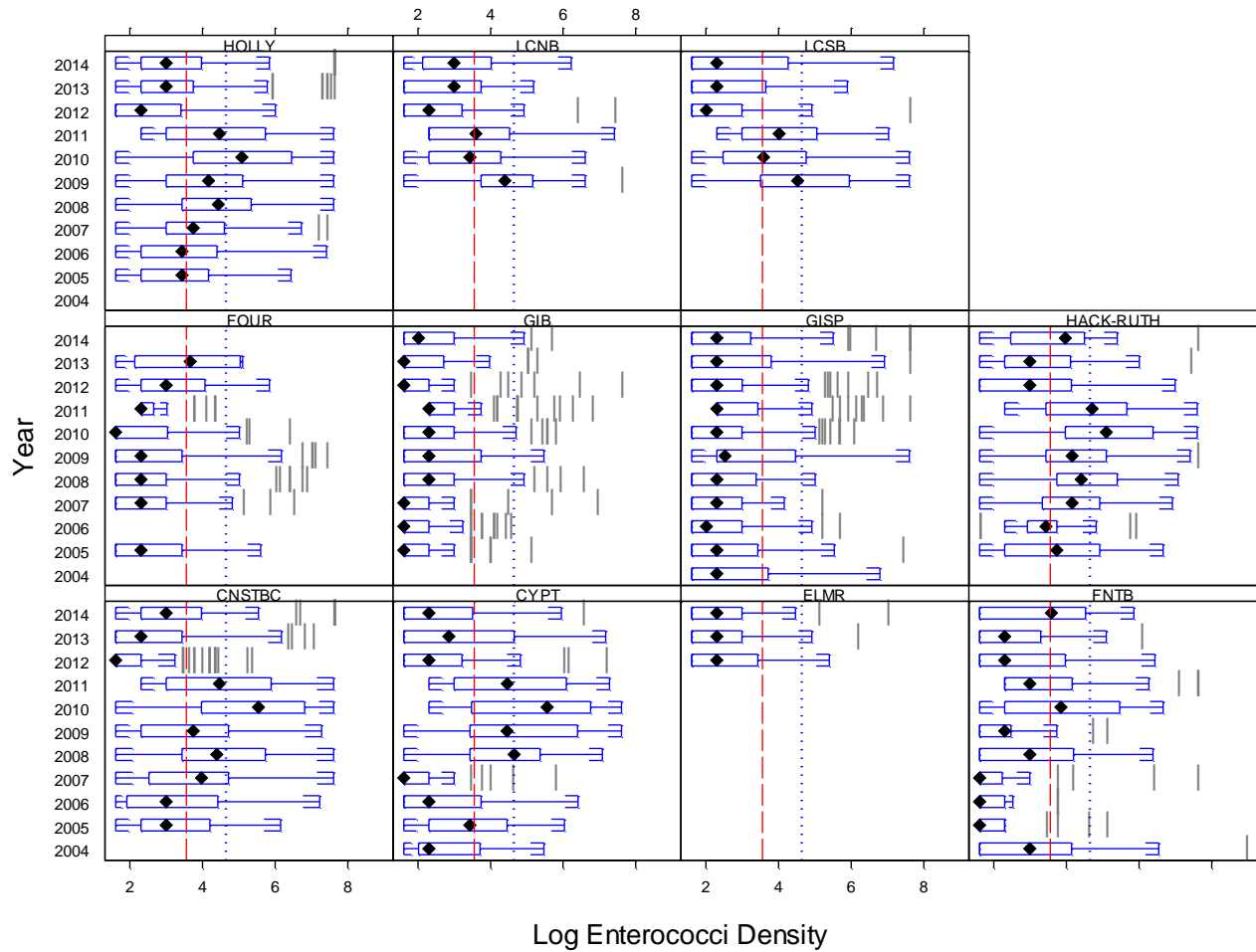


Figure 4. Distribution of \log_{10} enterococci densities by year within continuous beach segments relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

CHAPTER 4. Evaluation of Program Performance Relative to Data Quality Objectives.

Louisiana's BEACH Program Quality Assurance Project Plan (LDHH 2009) states that at the end of each year, the Program Manager shall audit the Program to determine if the Program's data quality objectives are being met. As described in the QAPP (see Table A7.1 of the QAPP), the Program's data quality objectives for those parameters measured in accordance with the QAPP are expressed in terms of accuracy, precision, and completeness goals. Those data quality objectives are repeated below in Table 11, together with their 2014 results.

Table 11. Data quality objectives and 2014 results.

Parameter	Concentration Units	QAPP Precision Goals (RPD)	2014 Precision Mean RPD (± 1 SE, n)	QAPP Completeness Goals	2014 Completeness
Enterococci	MPN/100ml	Sample 60%; lab 45%	Sample 44.0% (± 7.5 , 27); lab 44.9% (± 7.1 , 46)	98%	94%
Fecal Coliform	MPN/100ml	Sample 60%; lab 45%	Sample 61.6% (± 10.0 , 27); lab 54.5% (± 7.1 , 46)	98%	94%
Salinity	ppt	Sample 10%, lab 5%	Sample 0.3% (± 0.1 , 27); lab 0.7% (± 0.3 , 46)	98%	94%
Surface Water Temperature	°F	$\pm 2^\circ$	$\pm 2^\circ$ by SOP	98%	100%
Tide Conditions	NA	NA	NA	98%	100%
Weather	NA	NA	NA	98%	100%
Wind Direction	NA	NA	NA	98%	100%
Wind Speed	NA	NA	NA	98%	100%
Precipitation	Inches/ previous 24 hours	NA	NA	98%	100%
River Stage	Feet on flood gauge	NA	NA	98%	100%

To evaluate compliance with the established data quality objectives (DQOs) for sample and laboratory precision on estimated indicator organism densities and salinity, the results from QC samples, which are always collected in conjunction with a routine sample, calibration sample or resample, were compared to the corresponding sample result. Prior to the start of the monitoring period, approximately 10% of scheduled samples (routine and calibration samples) were designated as quality control samples. QC samples were selected at random at the beginning of the sampling period in approximately equal proportions (~ 5% each) of field duplicate and field split samples. Unscheduled QC samples were also collected during some routine sample events, which are also included in the QC evaluation. Sampling and laboratory precision were then

estimated from each quality control sample by calculating the relative percent difference (*Sample RPD*) as follows:

$$\text{Sample RPD} = \frac{|C_1 - C_2|}{(C_1 + C_2)/2} \times 100$$

where C_1 is the routine sample (or calibration or resample) result and C_2 is the quality control sample result. To estimate precision across samples, the mean and standard deviation of Sample RPDs were calculated. Note that the precision goals are expressed as means, and compliance with precision goals is assessed by determining if the observed precision is statistically different from the goal.

During 2014, a total of 75 quality control samples were scheduled to be collected concurrent with the 720 routine samples, and were to consist of 30 field duplicates and 45 field-split samples. Of the 720 scheduled routine samples, 680 were collected resulting in 71 quality control samples were scheduled (27 field duplicates and 44 field split samples). Twenty-five (25; 93%) field duplicates and 43 (98%) field-split samples were collected as scheduled, resulting in 96% of QC samples collected as scheduled. Two unscheduled field duplicates and one unscheduled field-split sample were collected, resulting in a total of 27 field duplicate and 46 field split quality control samples collected, achieving 100% of the QC sample goal.

To evaluate compliance with QAPP precision goals, means and standard errors of sample RPDs were calculated for the 2014 QC samples and are presented in Table 11. Figures 5-7 show Sample RPD results relative to precision goals; if the lower error bar (lower 95th percentile) shown in the graph is below the goal, then the goal has been achieved. All precision goals were achieved for 2014. Field splits were designed to estimate the variability of the analysis process, or “lab” precision, plus any minor imprecision resulting from sample handling and transport. Field duplicates were designed to incorporate lab variability plus sampling variability to estimate the variability of collecting another sample at approximately the same place and time.

Completeness is the percentage of measurements made that are judged to be valid according to specific criteria and entered into the data management system. Percent completeness (%C) for measurement parameters was estimated as follows:

$$\%C = \frac{V}{T} \times 100$$

where V is the number of measurements judged valid and T is the total number of measurements. During 2014, of the 720 scheduled routine samples, 680 were collected (94.4%), with 40 station-weeks missed due to lab handling problems and protracted sample holding times resulting in lab rejection of delivered samples. Of the 680 samples successfully processed, all results were considered valid and recorded in the Program’s database. All processed samples had complete laboratory- and field-collected data. Because samples rejected by the lab due to protracted holding times were near the end of the swimming season, replacement samples were not collected. It is anticipated that LDHH’s laboratory will be relocated from New Orleans to Baton Rouge prior to the start of the 2015 sampling period (1 April), reducing sample holding times, particularly for Cameron Parish beaches from which the 2014 rejected samples originated.

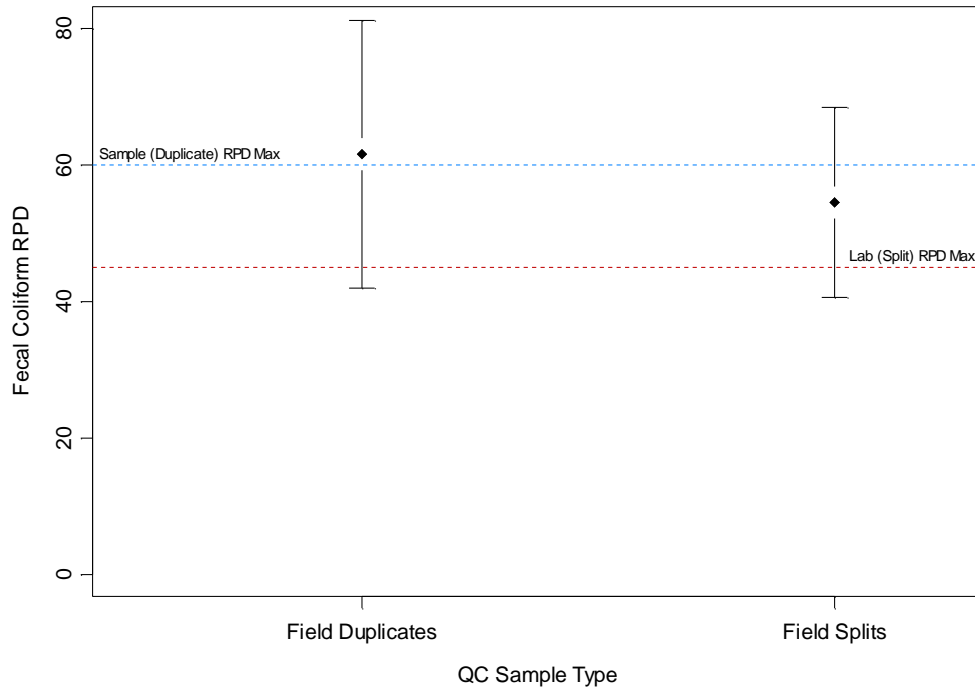


Figure 5. Comparison of 2014 monitoring season mean fecal coliform relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

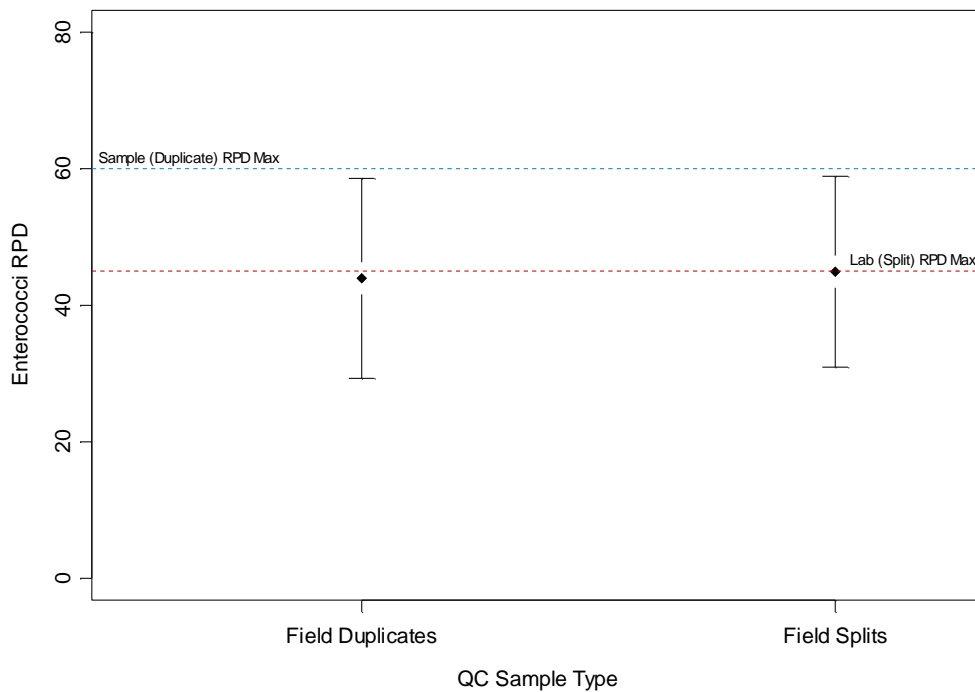


Figure 6. Comparison of 2014 monitoring season mean enterococci relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

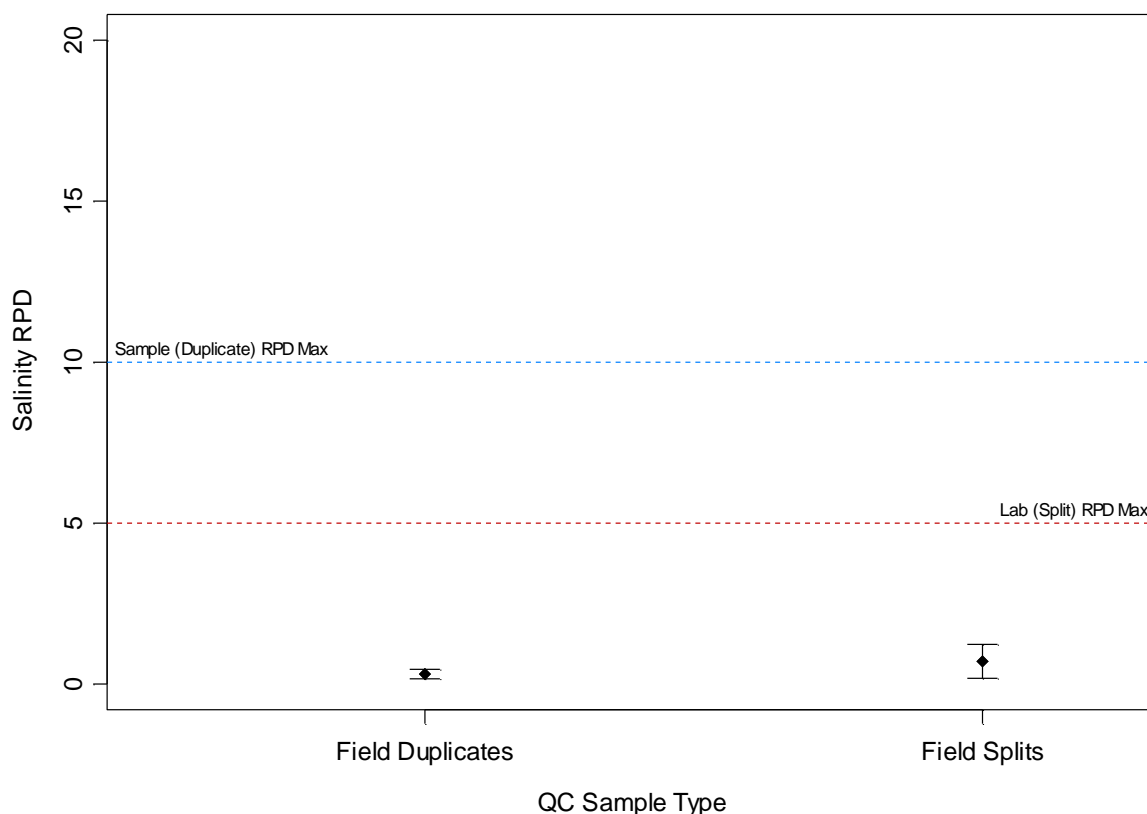


Figure 7. Comparison of 2014 monitoring season mean salinity relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

Based on a thorough review of the data recorded for the 2014 season, completeness goals for enterococci, fecal coliform and salinity were not met (94% complete versus 98% goal). There were no other variances from the QAPP. In addition to the audit and data review described above, the BEACH Program Manager/Quality Assurance Officer verified throughout the 2014 sampling period that:

- All elements of the QAPP were being correctly implemented as prescribed;
- The quality of the data generated by implementation of the QAPP was adequate; and
- Corrective actions, when needed, were implemented in a timely manner and their effectiveness was confirmed.

All monitoring and notification data collected during 2014 have been uploaded to USEPA's BEACH (PRAWN) and STORET data systems via WQX submission of an XML formatted file.

REFERENCES

- Louisiana Department of Health and Hospitals. 2003. Louisiana's BEACH Grant Final Report, Grant Year 2001. Louisiana Department of Health and Hospitals, Office of Public Health.
- Louisiana Department of Health and Hospitals. 2014. Louisiana's BEACH Program Quality Assurance Project Plan; Version 2.f. Louisiana Department of Health and Hospitals, Office of Public Health.
- USEPA. 2002. *Implementation Guidance on Water Quality Criteria for Beaches. Draft. May 2002.* EPA-823-B-02-003. U.S. Environmental Protection Agency, Office of Water, Washington, DC.
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APPENDIX A

Sample Station Names and USEPA IDs

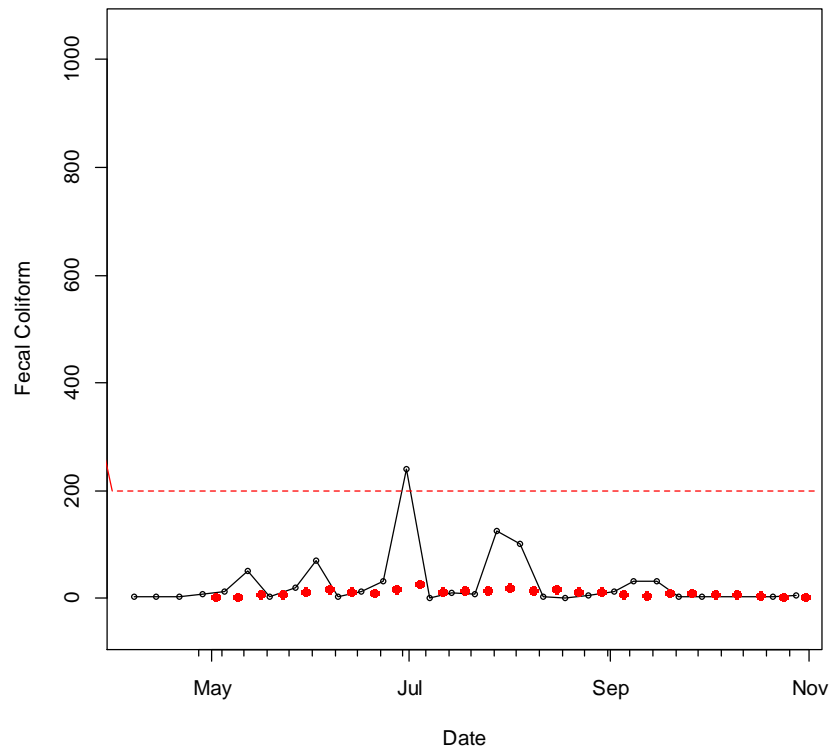
List of sample stations designated under the Louisiana BEACH Program by State ID, Beach Name, and USEPA IDs.

State ID	Beach Name	USEPA ID
CNST1	Constance Beach	LA134778
CYPT1	Cypremort Point State Park	LA971783
DUNG1	Long Beach	LA860482
ELMR1	Elmer's Island - 1	LA834833
ELMR2	Elmer's Island - 2	LA451844
FNTB1	Fontainebleau State Park	LA733869
FOUR1	Fourchon - 1	LA427986
FOUR2	Fourchon - 2	LA984228
FOUR3	Fourchon - 3	LA677480
FOUR4	Fourchon - 4	LA452669
GBRZ1	Gulf Breeze	LA725358
GIB1	Grand Isle Beach - 1	LA430483
GIB2	Grand Isle Beach - 2	LA325065
GIB3	Grand Isle Beach - 3	LA799656
GISP1	Grand Isle State Park - 1	LA240078
GISP2	Grand Isle State Park - 2	LA221569
GISP3	Grand Isle State Park - 3	LA204303
GISP4	Grand Isle State Park - 4	LA186192
HACK1	Hackberry Beach	LA720012
HOLLY1	Holly Beach - 1	LA489985
HOLLY2	Holly Beach - 2	LA829030
HOLLY3	Holly Beach - 3	LA109442
HOLLY4	Holly Beach - 4	LA697221
HOLLY5	Holly Beach - 5	LA164373
HOLLY6	Holly Beach - 6	LA467180
LCNB1	North Beach	LA202517
LCSB1	South Beach and Rabbit Island	LA981443
LTFL1	Little Florida	LA595220
MART1	Martin Beach	LA135245
PONT1	Pontchartrain Beach	LA960851
RUTH1	Rutherford Beach	LA284049

APPENDIX B

Time Series of Water Quality Results By Sample Station

A



B

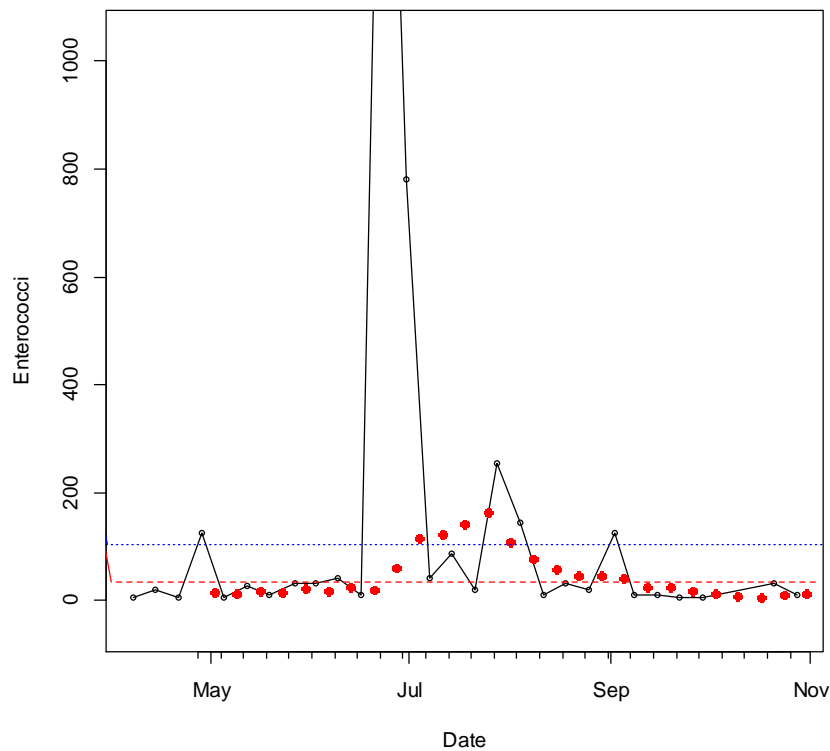
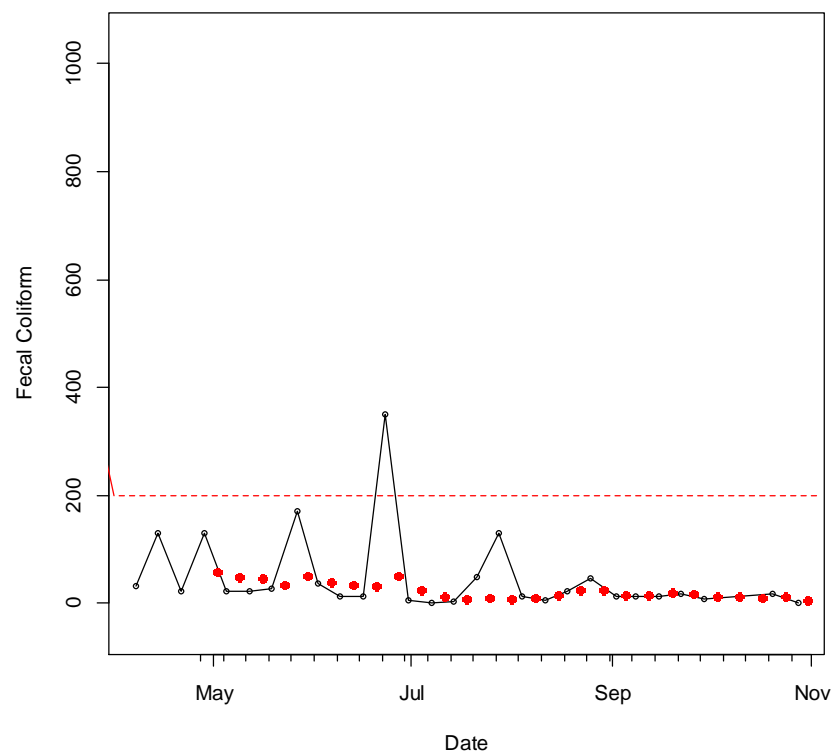


Figure B.1. Time series of fecal coliform (A) and enterococci (B) sample results collected during 2014 at CNST1. Sample results are shown as open dots (\circ), running 30-day geometric means are shown as red dots (\bullet), and geometric mean and single sample maximum criteria are shown as red and blue dashed horizontal lines, respectively.

A



B

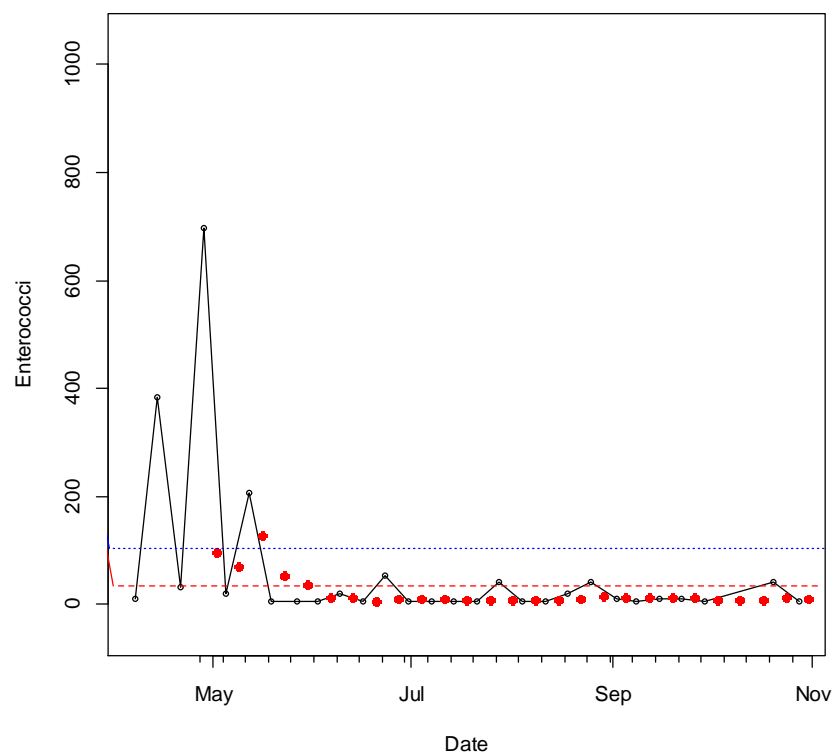
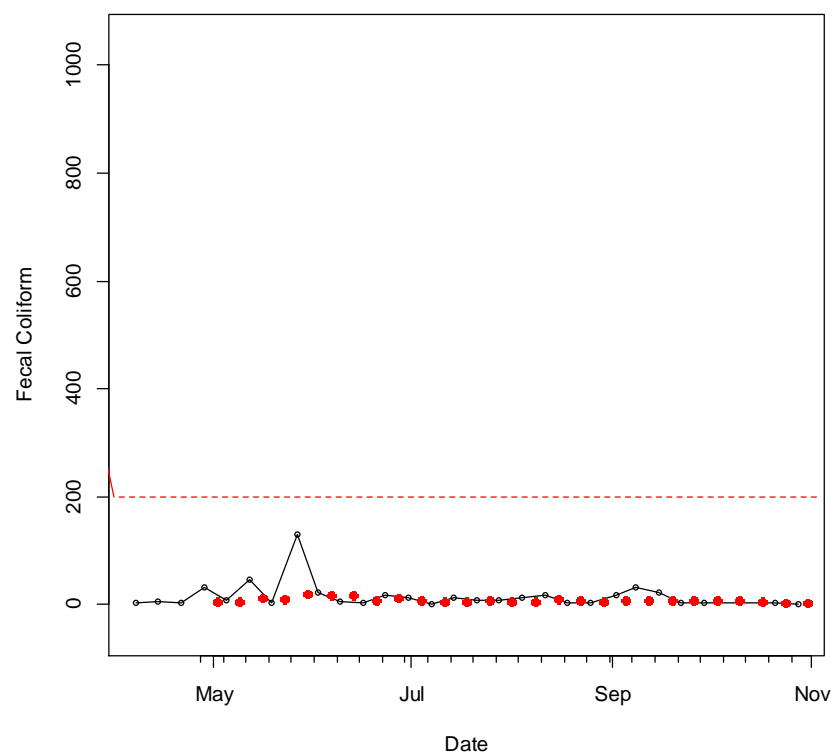


Figure B.2. Time series of sample results collected during 2014 at CYPT1.

A



B

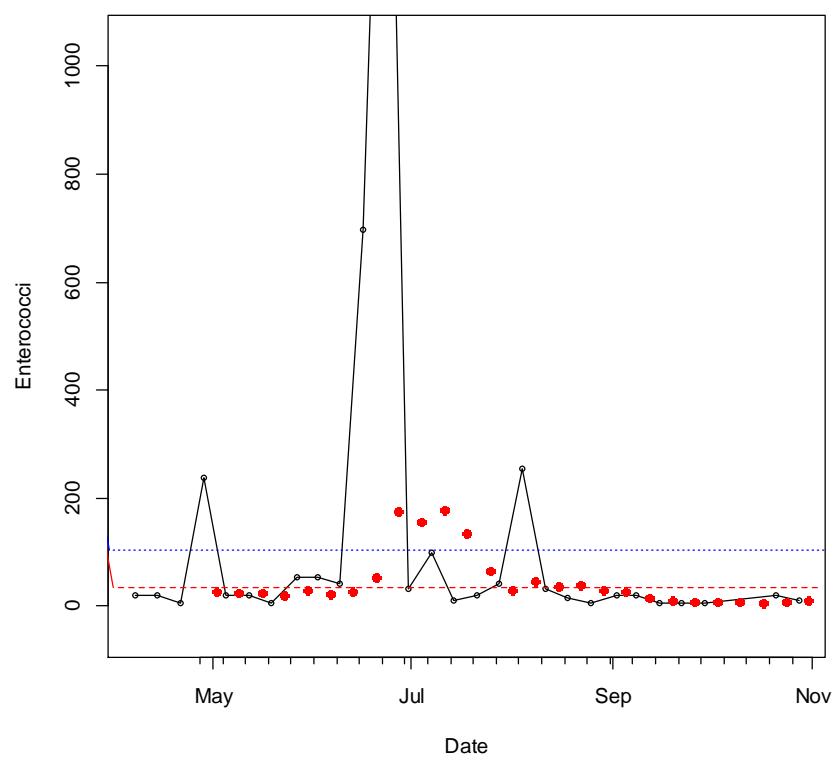
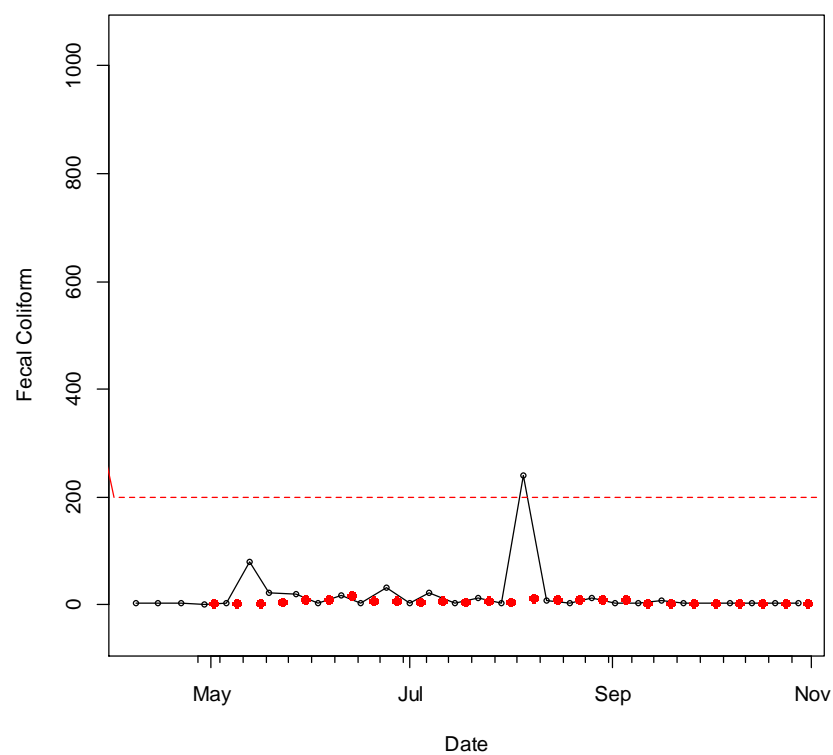


Figure B.3. Time series of sample results collected during 2014 at DUNG1.

A



B

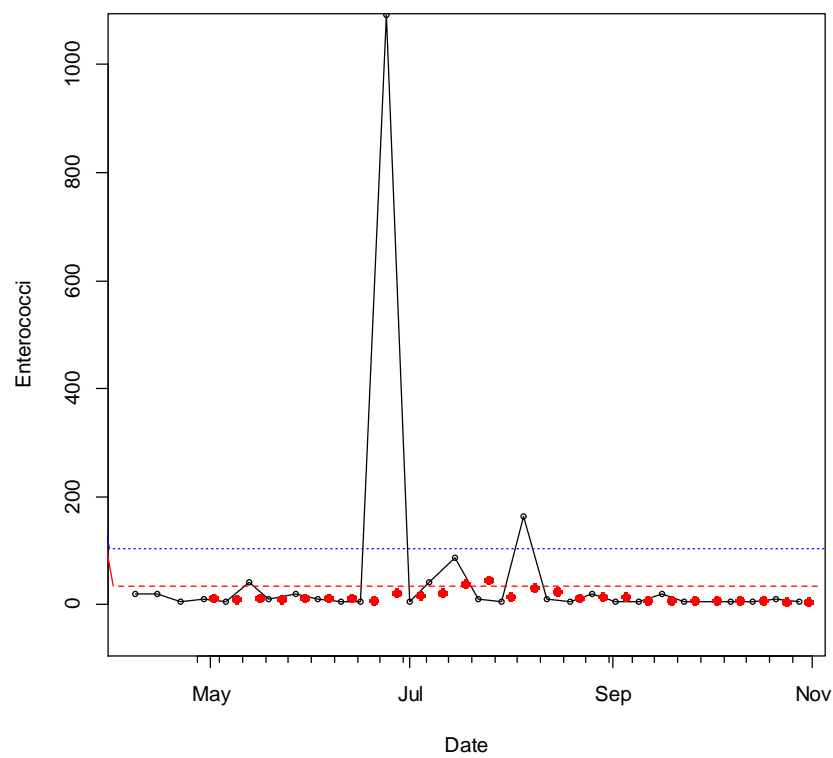
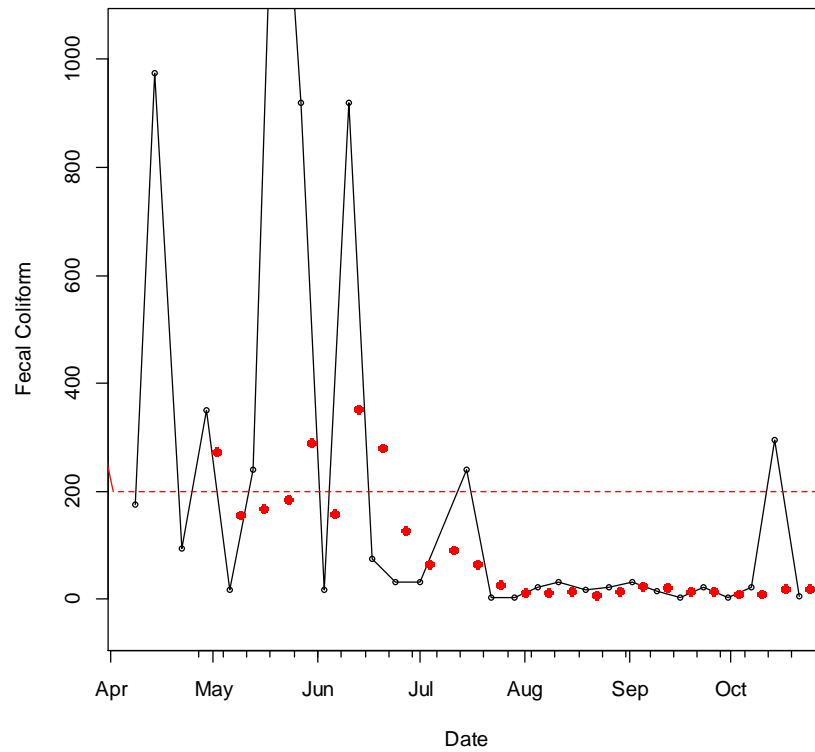


Figure B.4. Time series of sample results collected during 2014 at ELMR1.

A



B

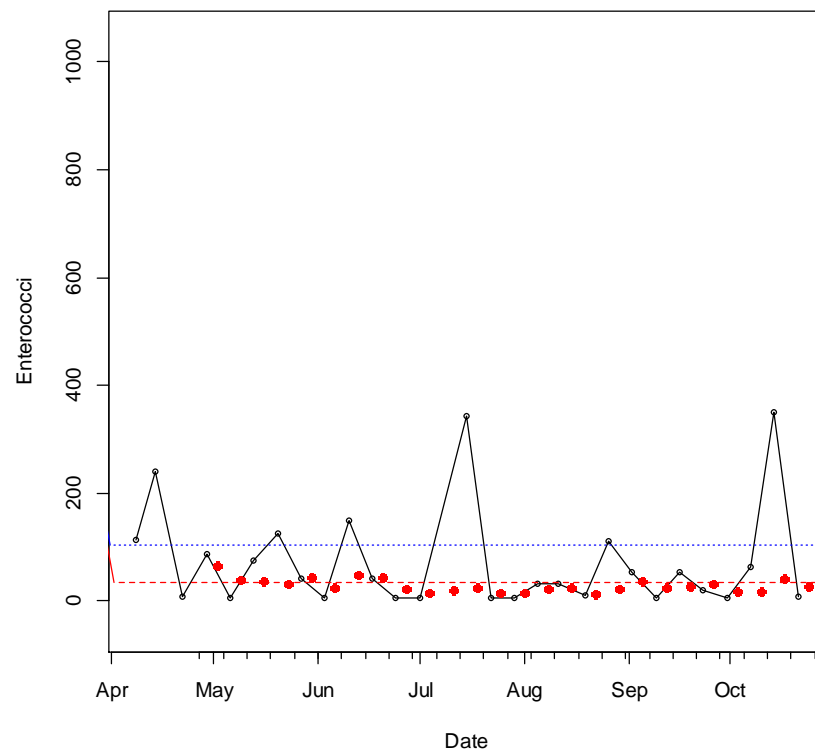
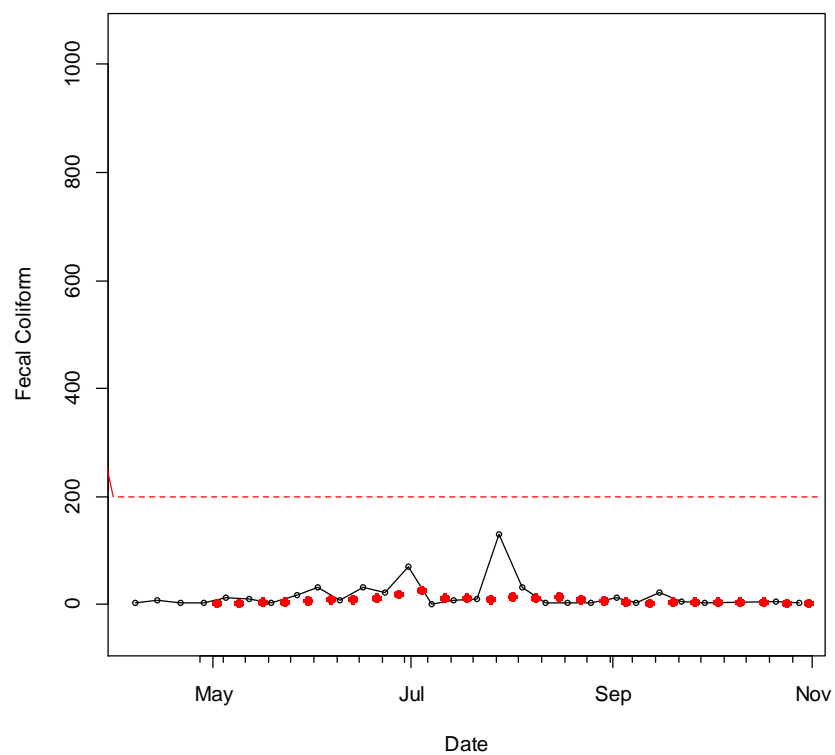


Figure B.5. Time series of sample results collected during 2014 at FNTB1.

A



B

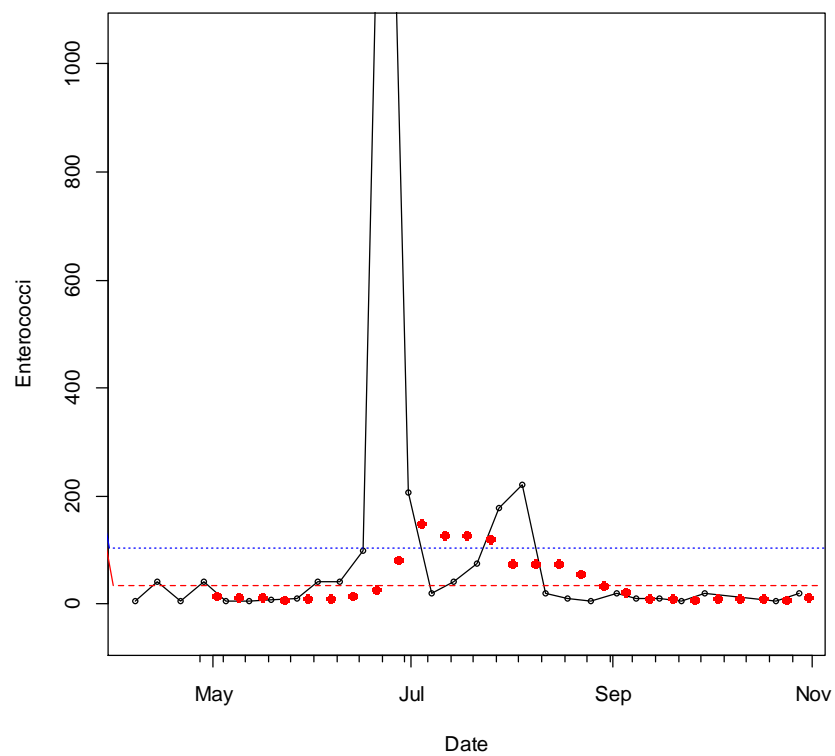
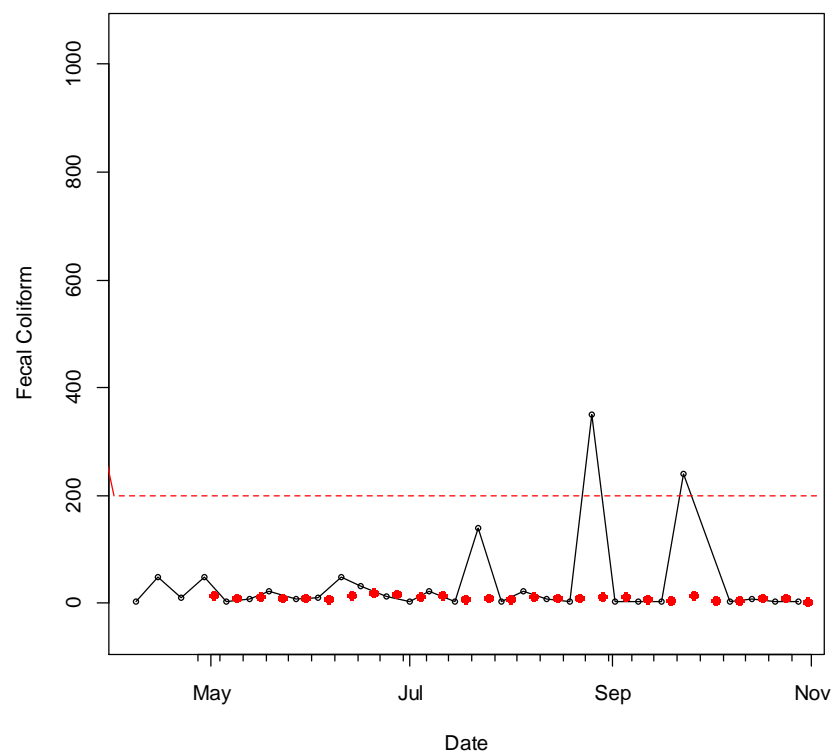


Figure B.6. Time series of sample results collected during 2014 at GBRZ1.

A



B

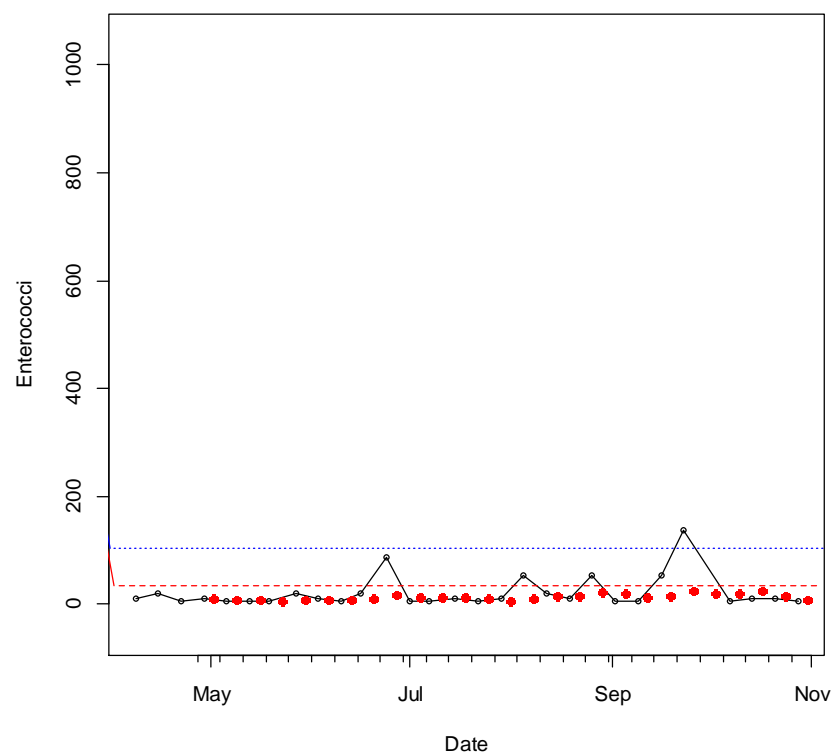
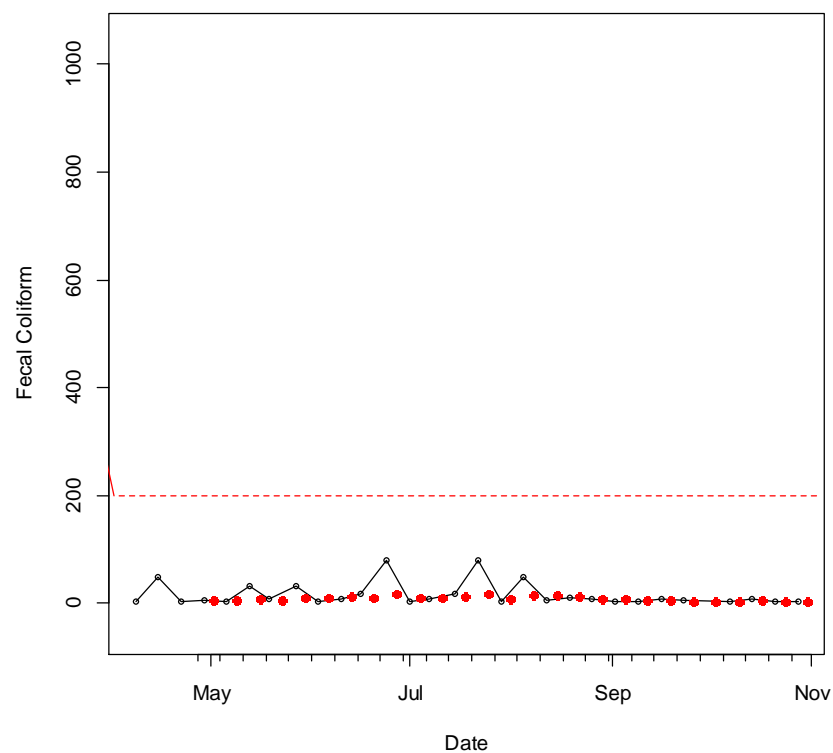


Figure B.7. Time series of sample results collected during 2014 at GIB1.

A



B

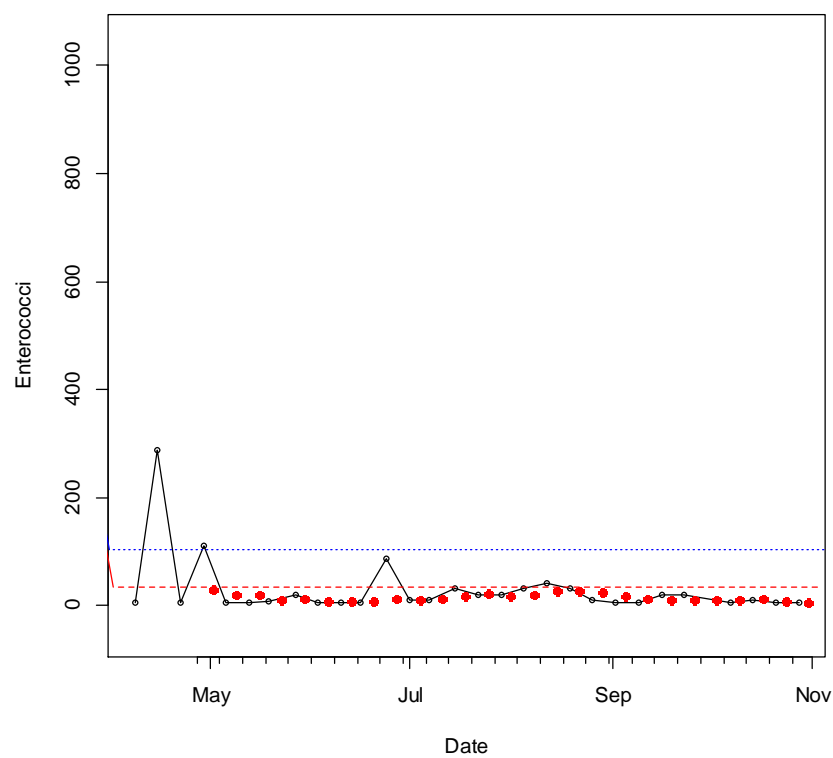
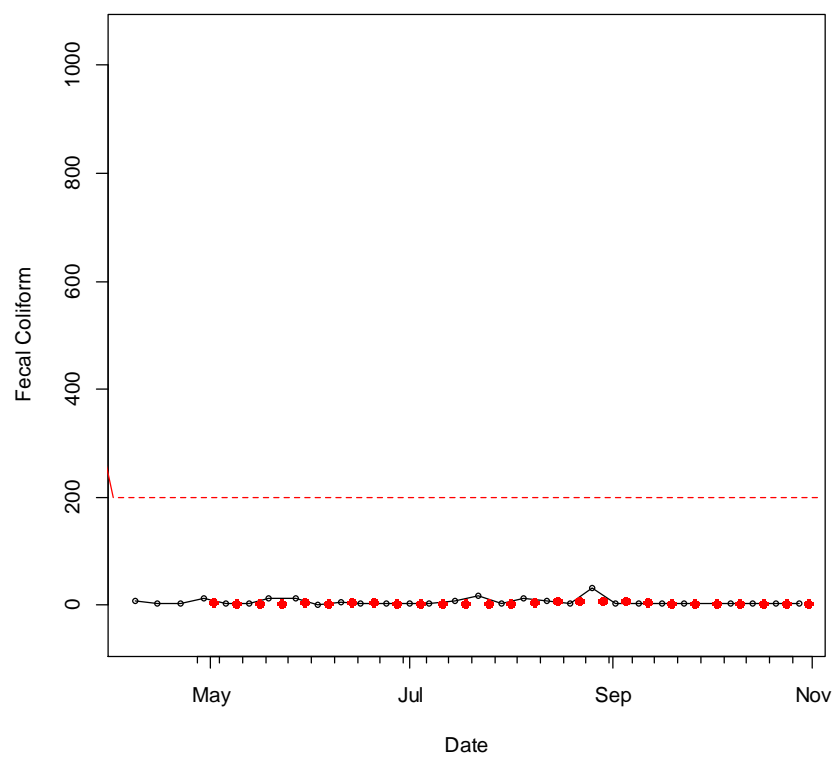


Figure B.8. Time series of sample results collected during 2014 at GIB2.

A



B

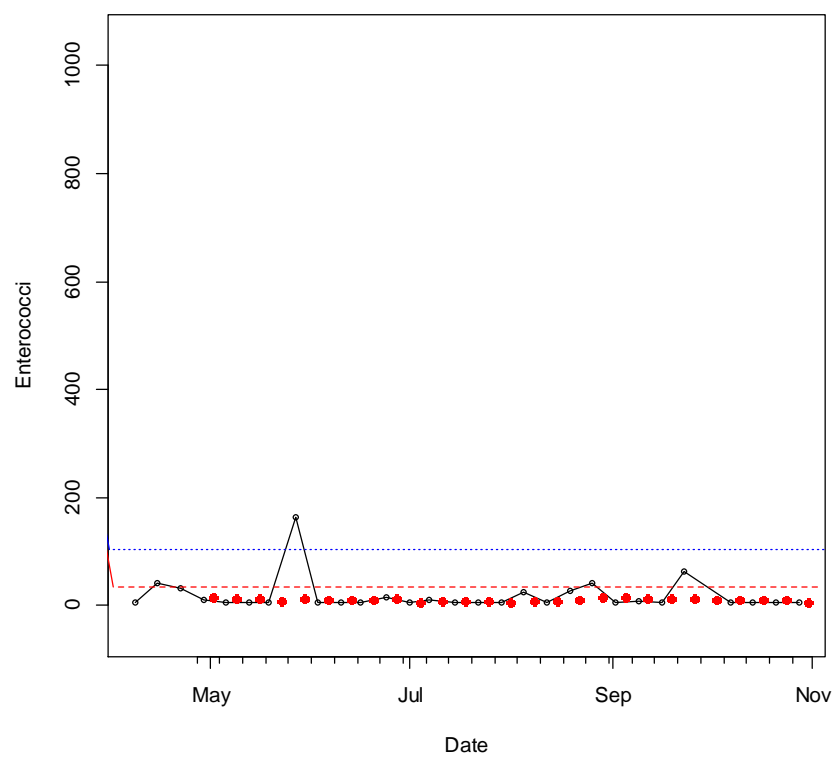
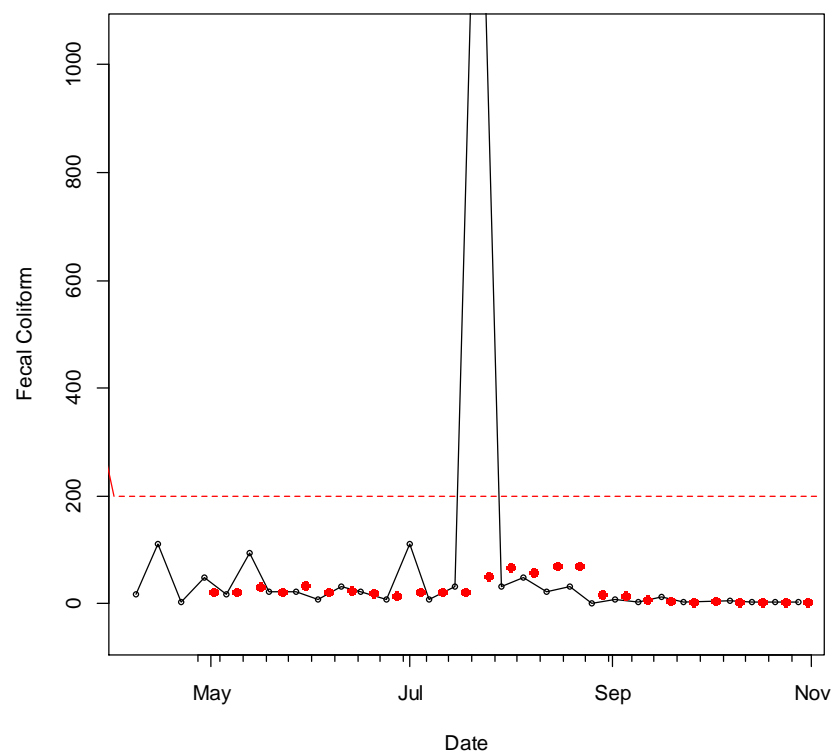


Figure B.9. Time series of sample results collected during 2014 at GIB3.

A



B

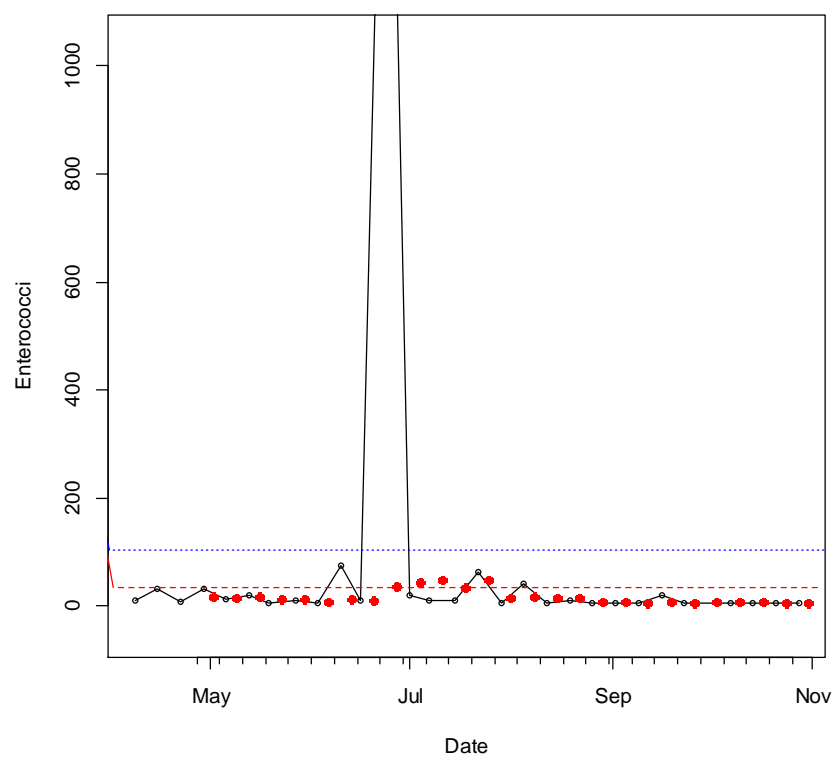
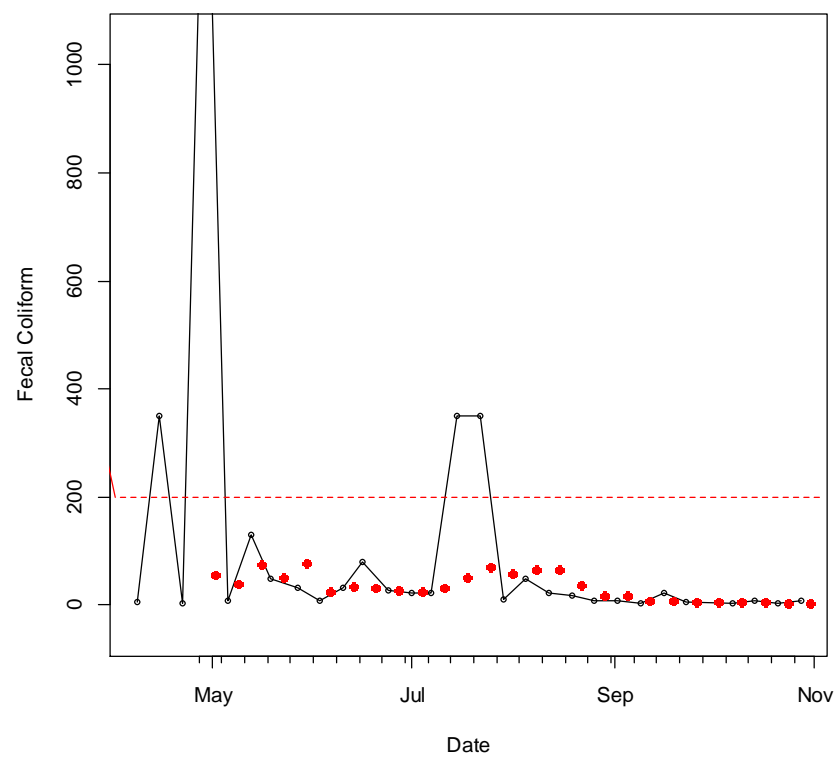


Figure B.10. Time series of sample results collected during 2014 at GISP1.

A



B

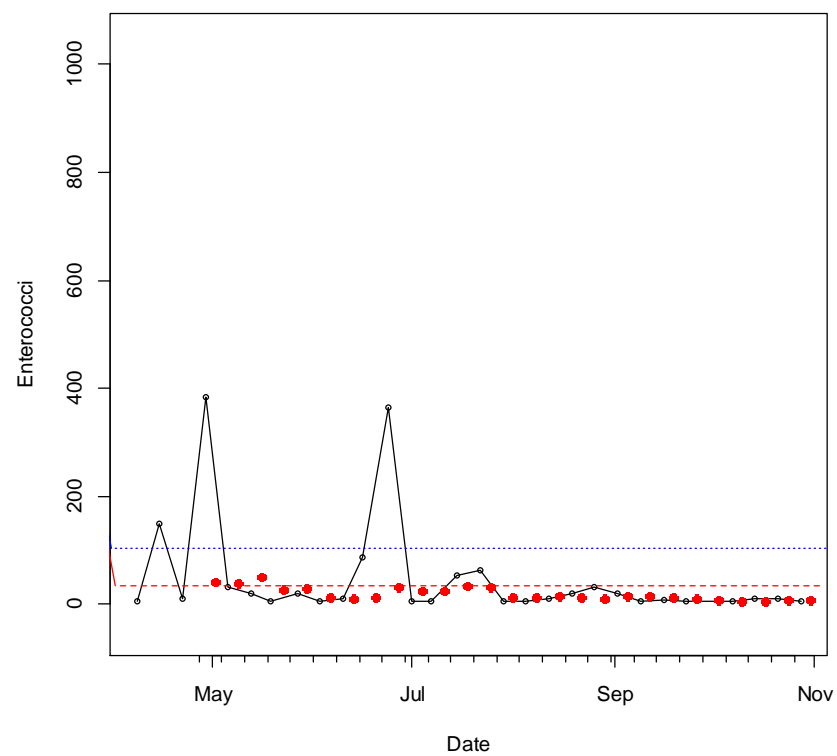
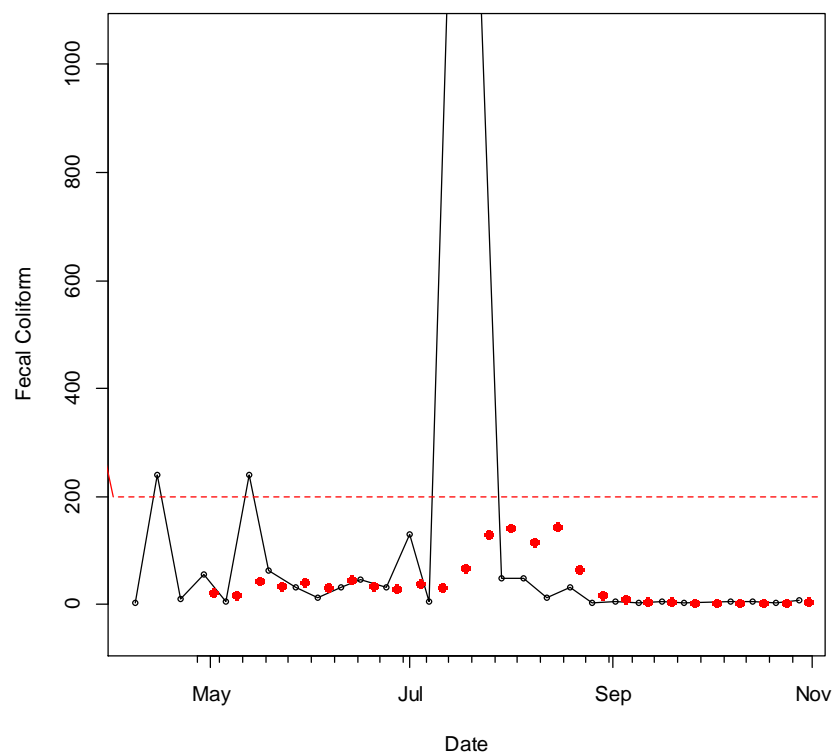


Figure B.11. Time series of sample results collected during 2014 at GISP2.

A



B

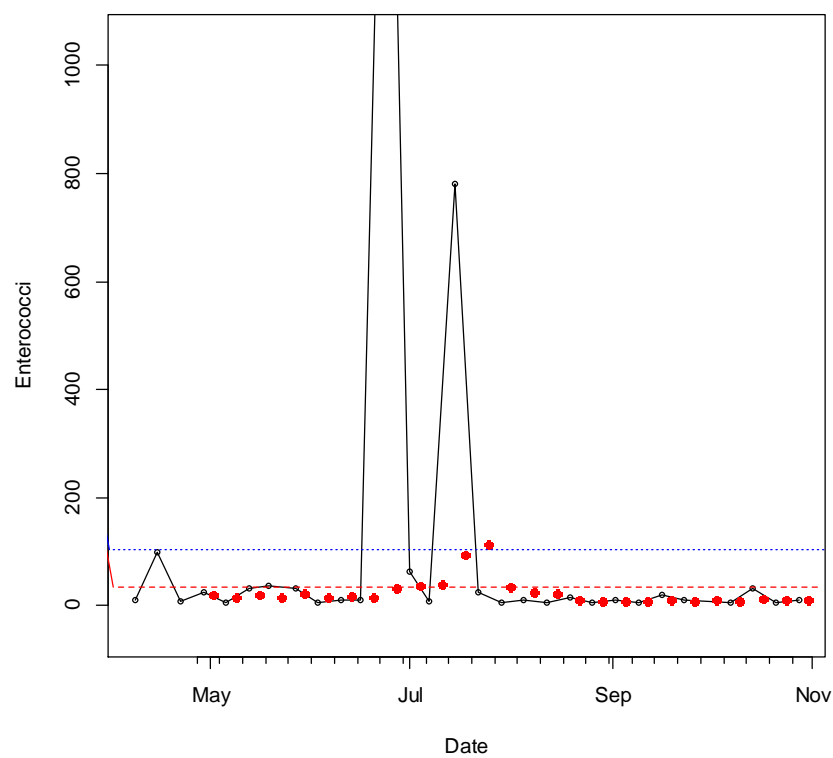
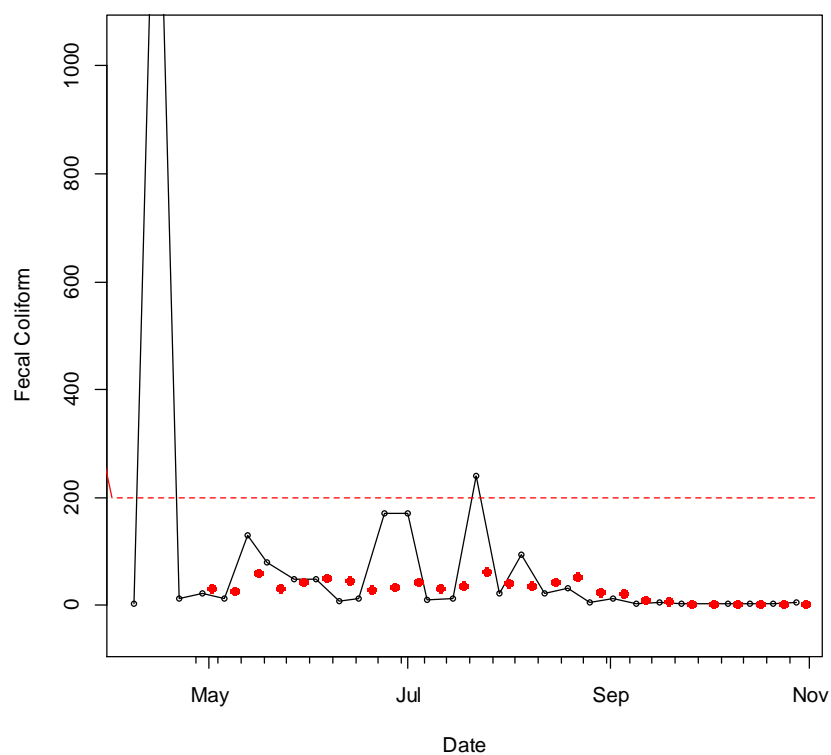


Figure B.12. Time series of sample results collected during 2014 at GISP3.

A



B

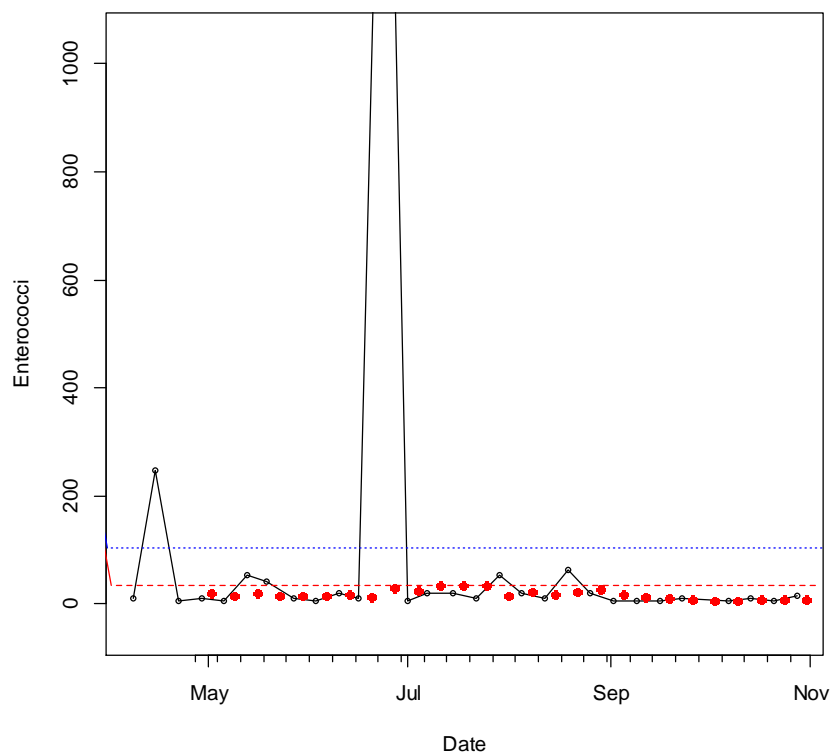
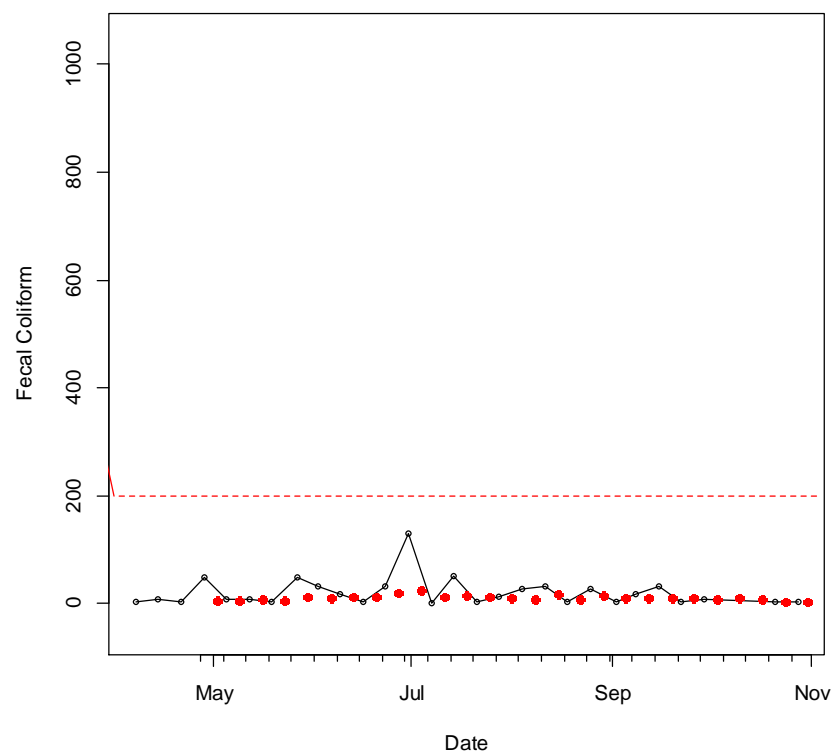


Figure B.13. Time series of sample results collected during 2014 at GISP4.

A



B

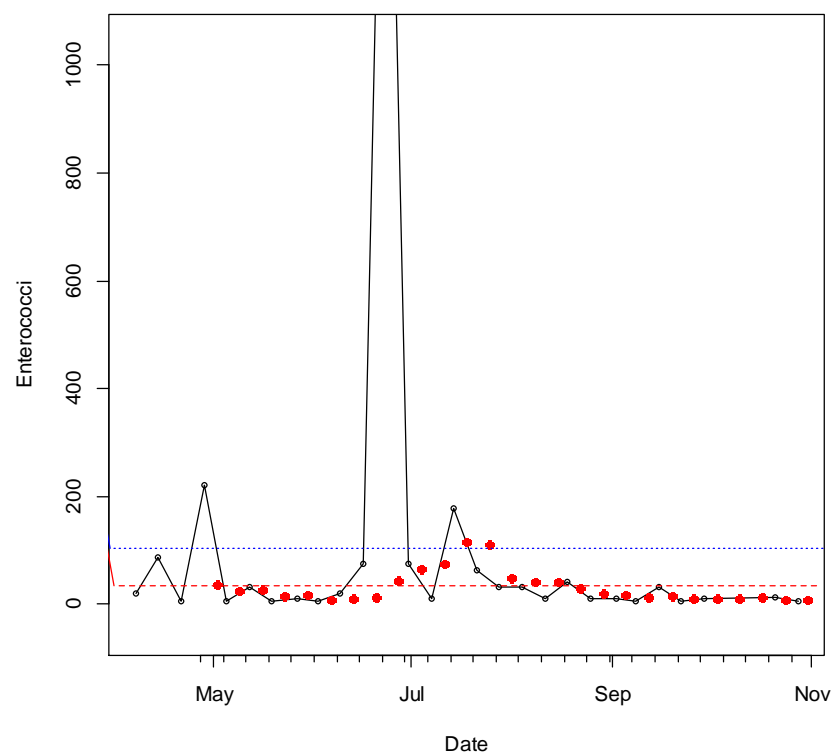
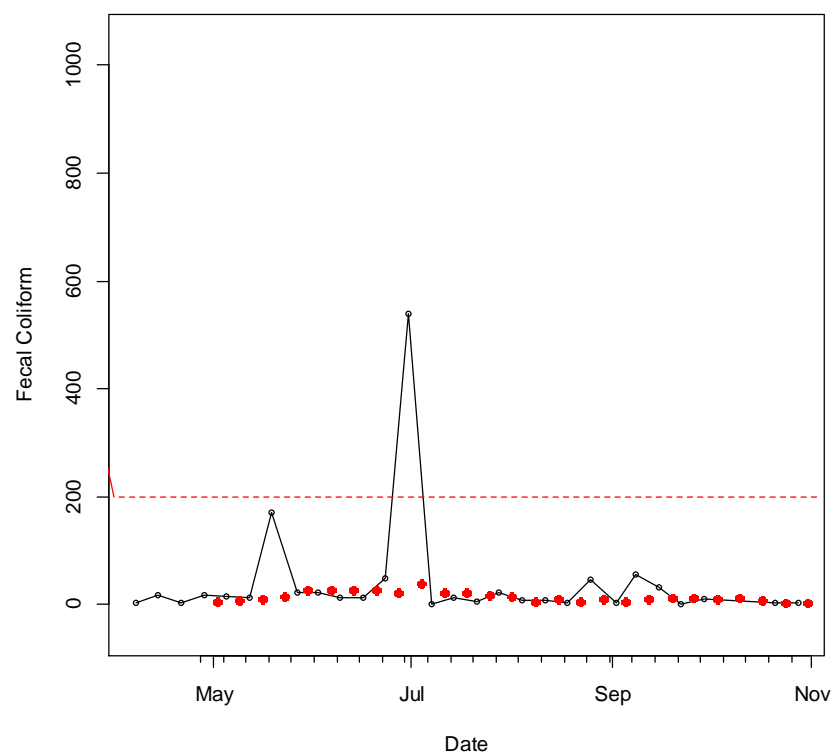


Figure B.14. Time series of sample results collected during 2014 at HOLLY1.

A



B

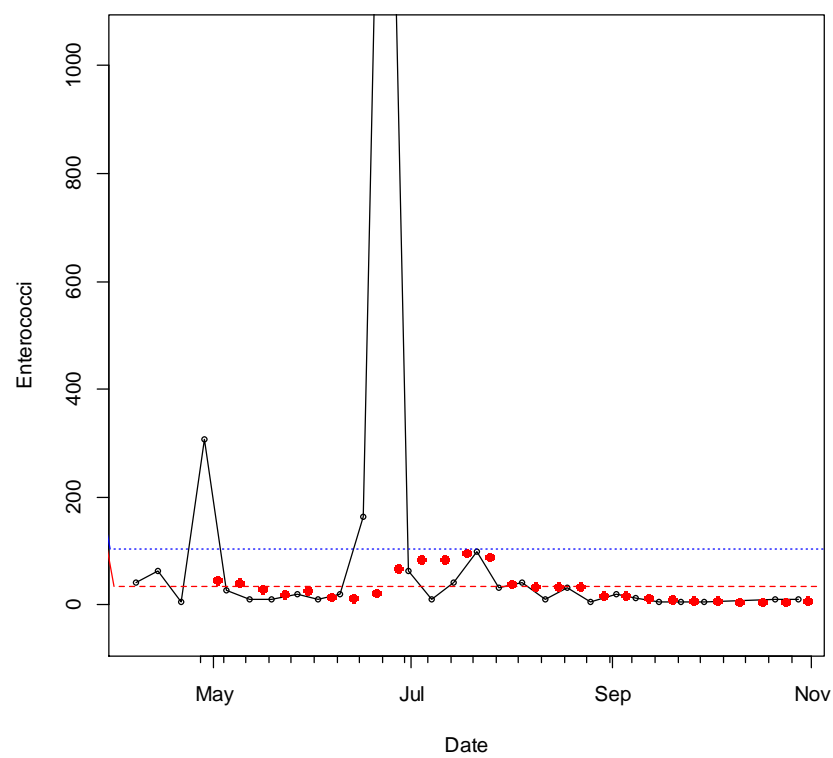
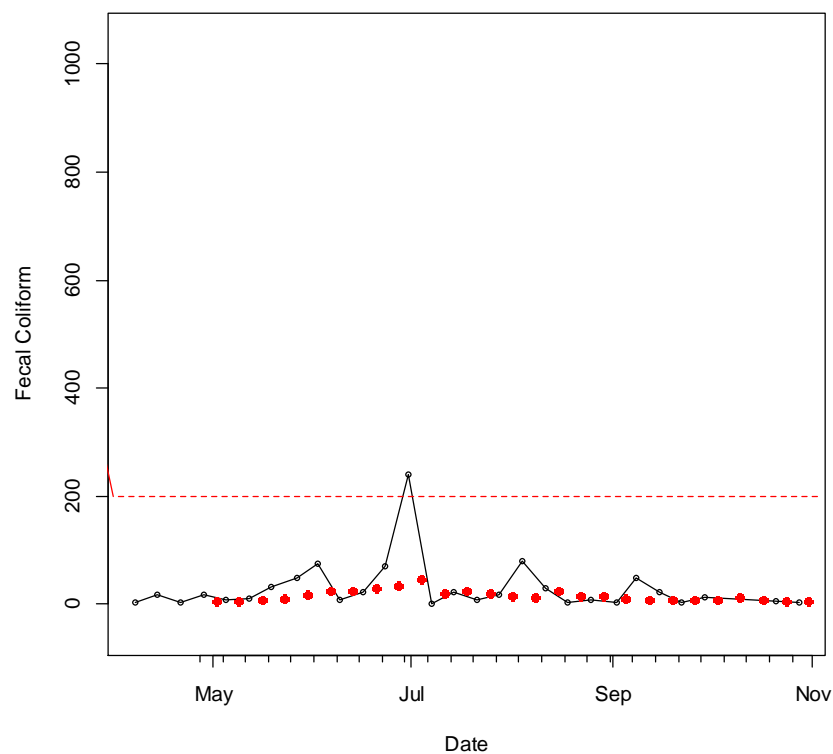


Figure B.15. Time series of sample results collected during 2014 at HOLLY2.

A



B

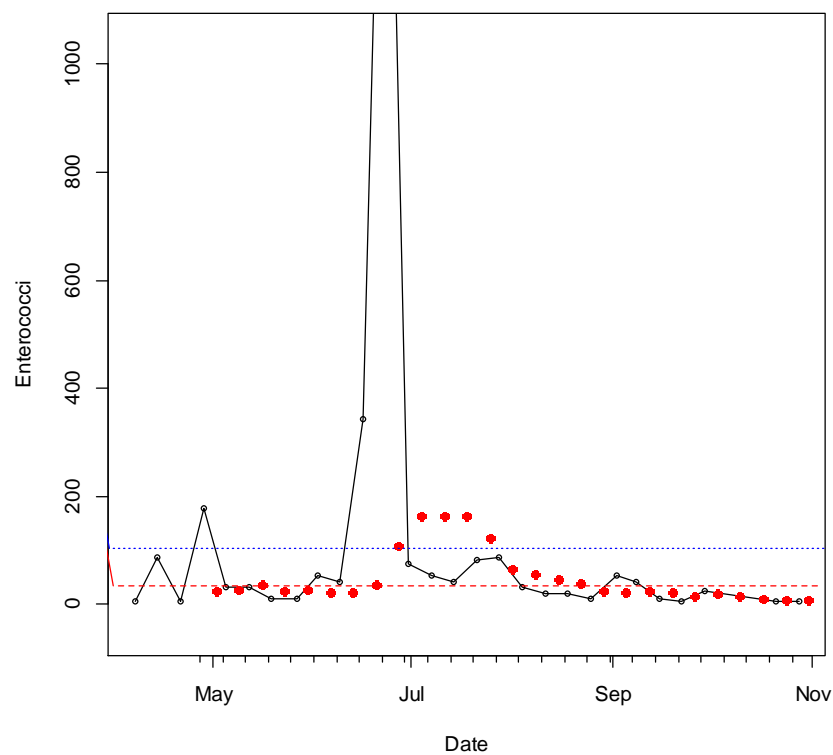
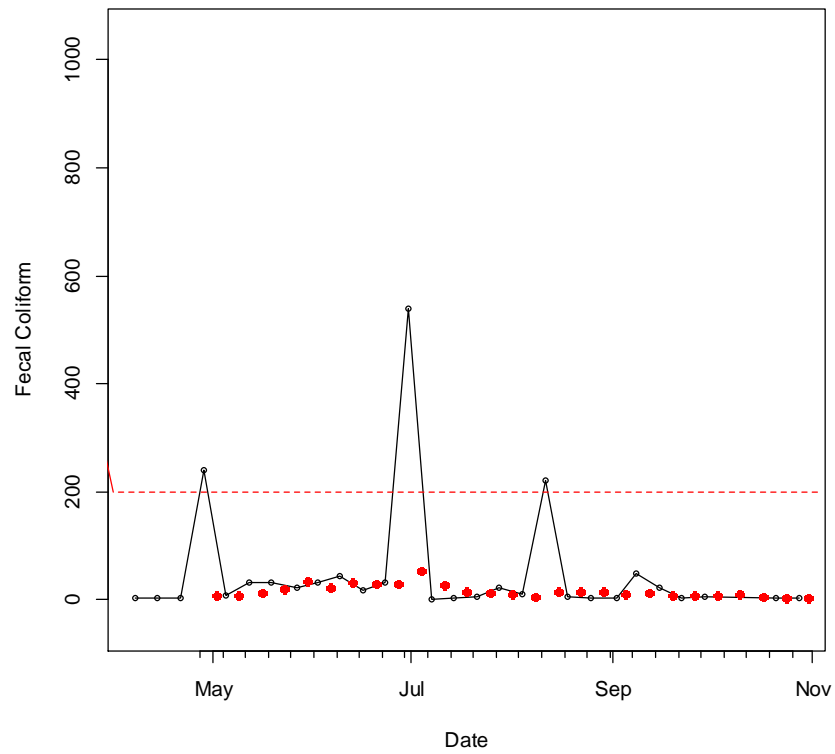


Figure B.16. Time series of sample results collected during 2014 at HOLLY3.

A



B

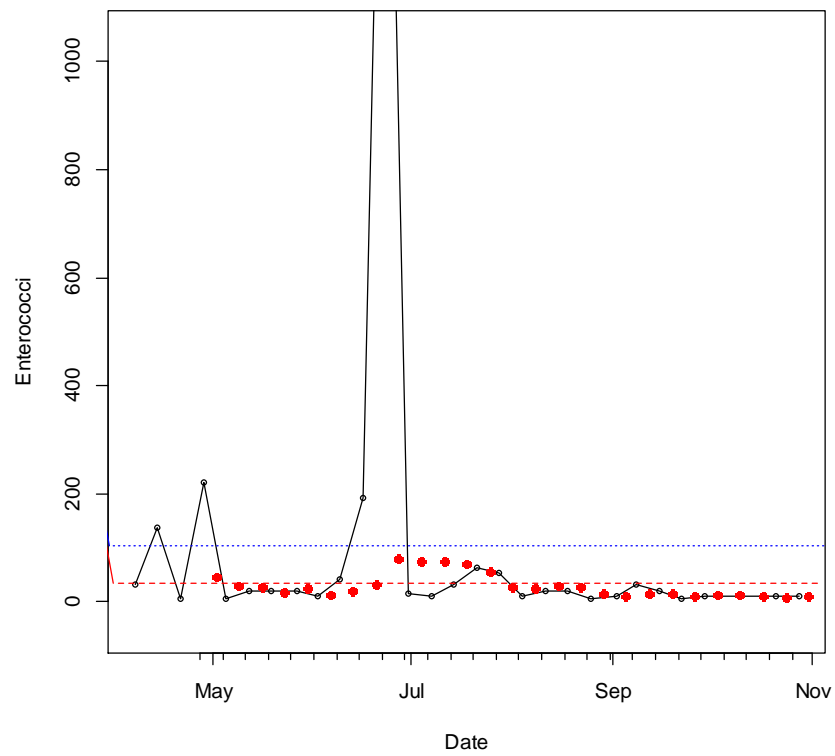
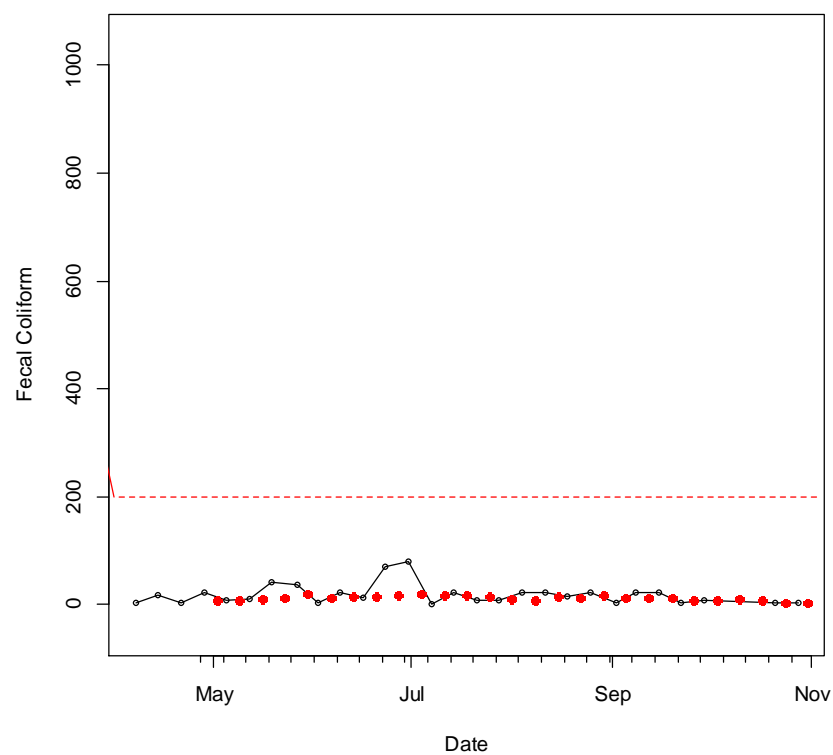


Figure B.17. Time series of sample results collected during 2014 at HOLLY4.

A



B

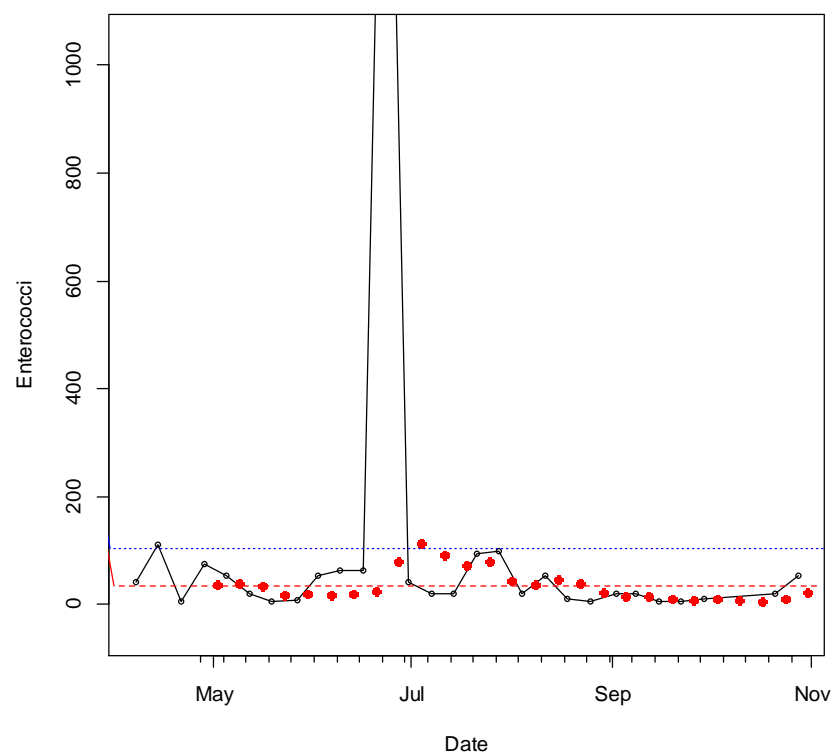
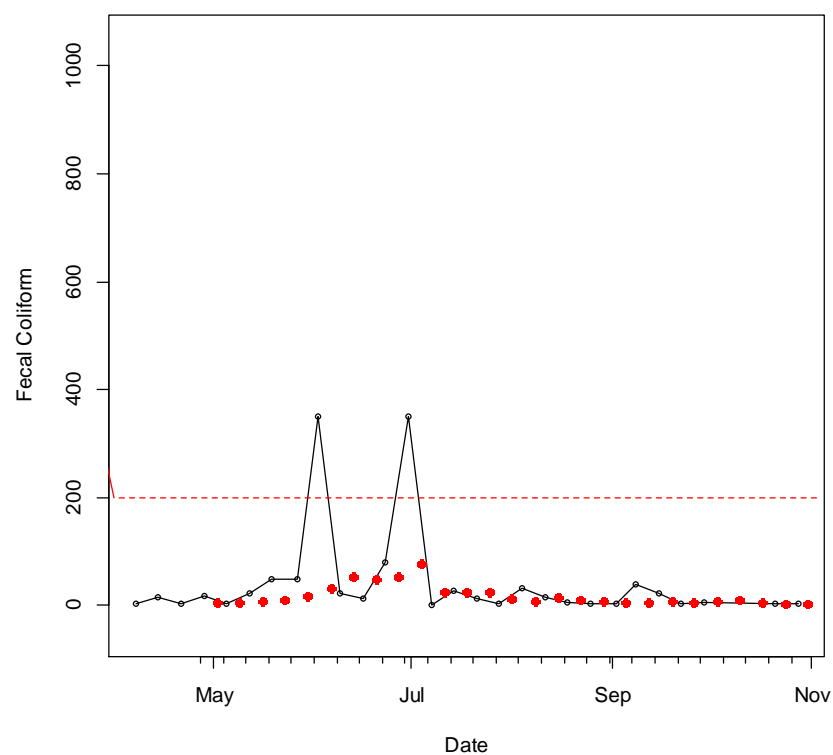


Figure B.18. Time series of sample results collected during 2014 at HOLLY5.

A



B

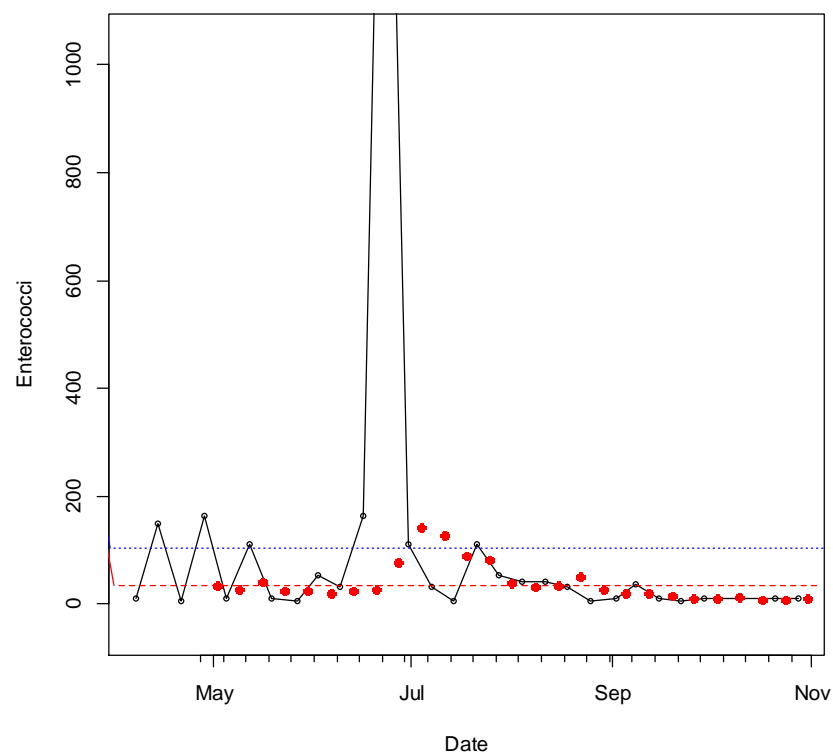
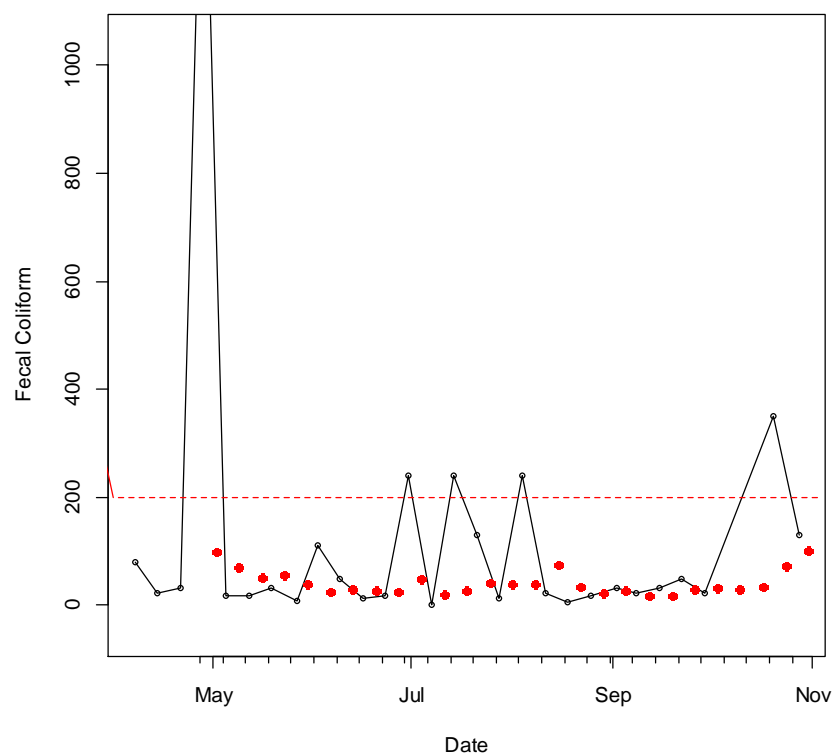


Figure B.19. Time series of sample results collected during 2014 at HOLLY6.

A



B

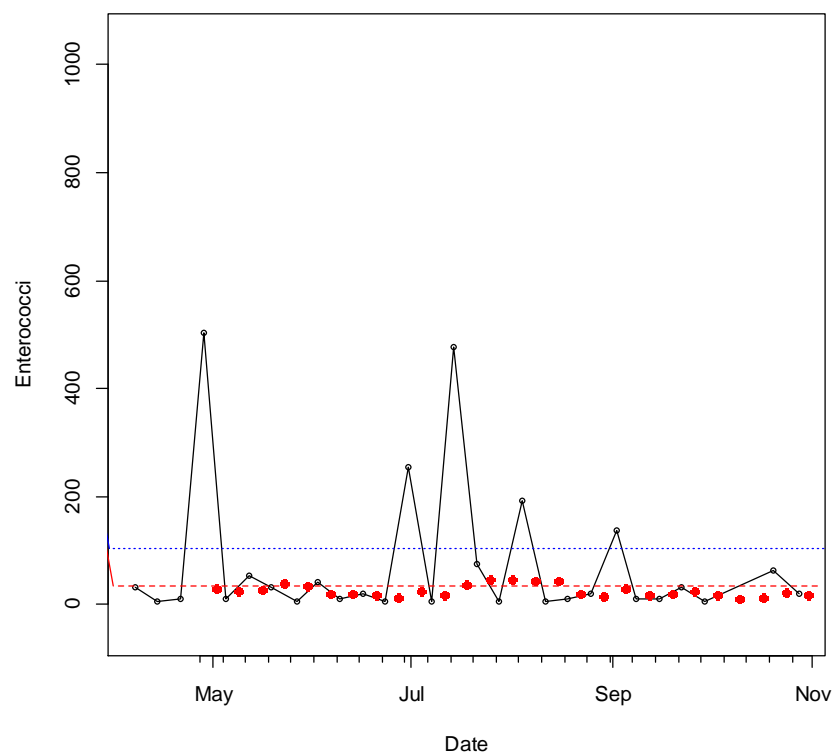
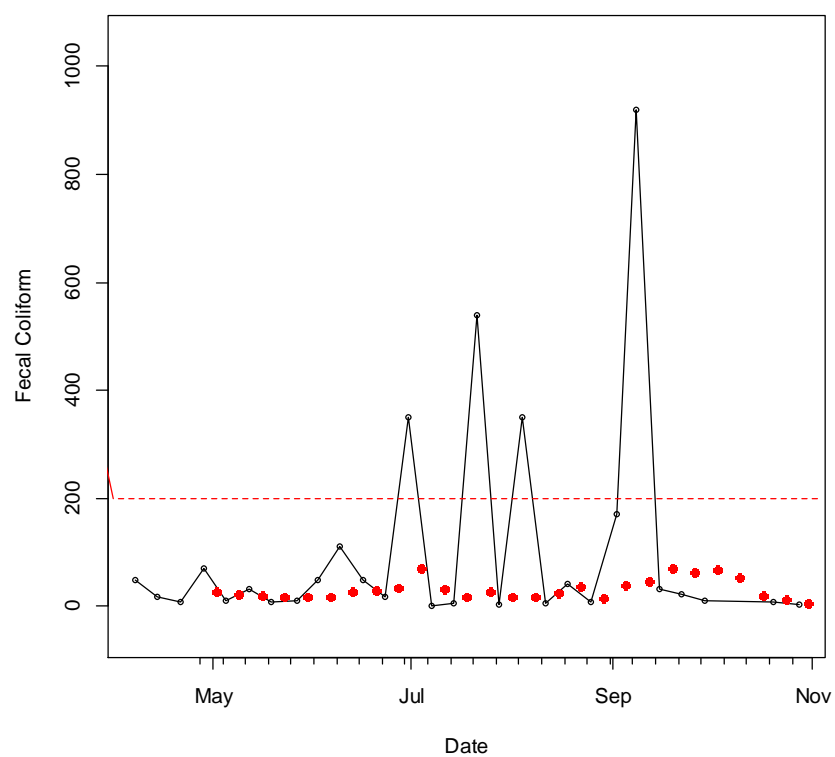


Figure B.20. Time series of sample results collected during 2014 at LCNB1.

A



B

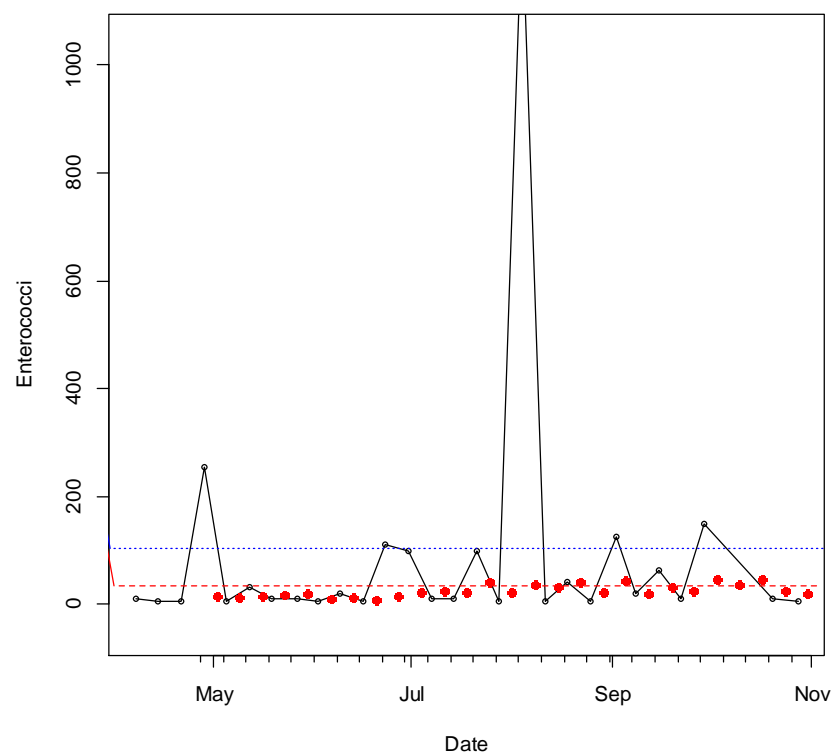
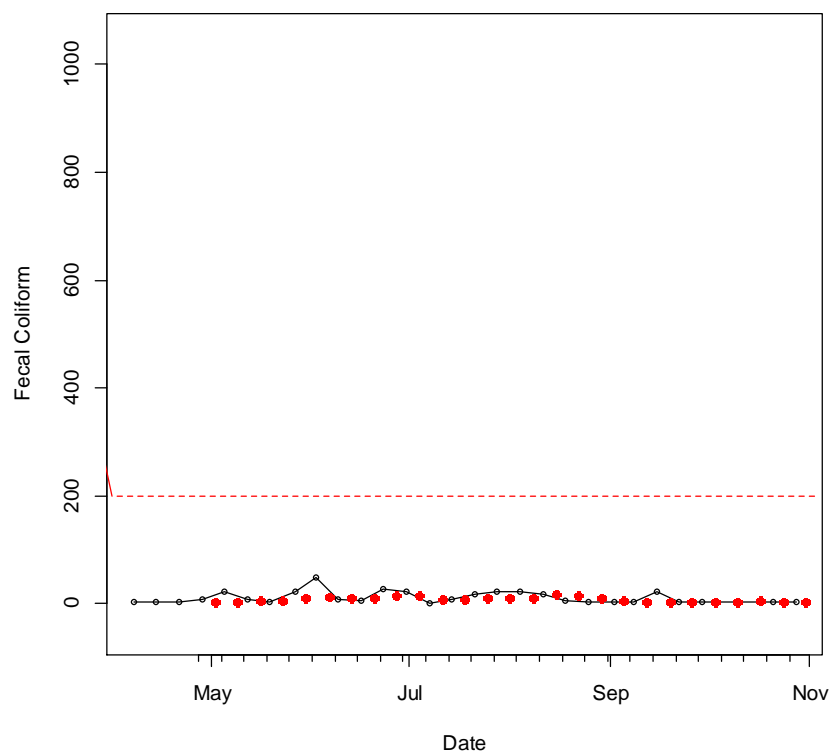


Figure B.21. Time series of sample results collected during 2014 at LCSB1.

A



B

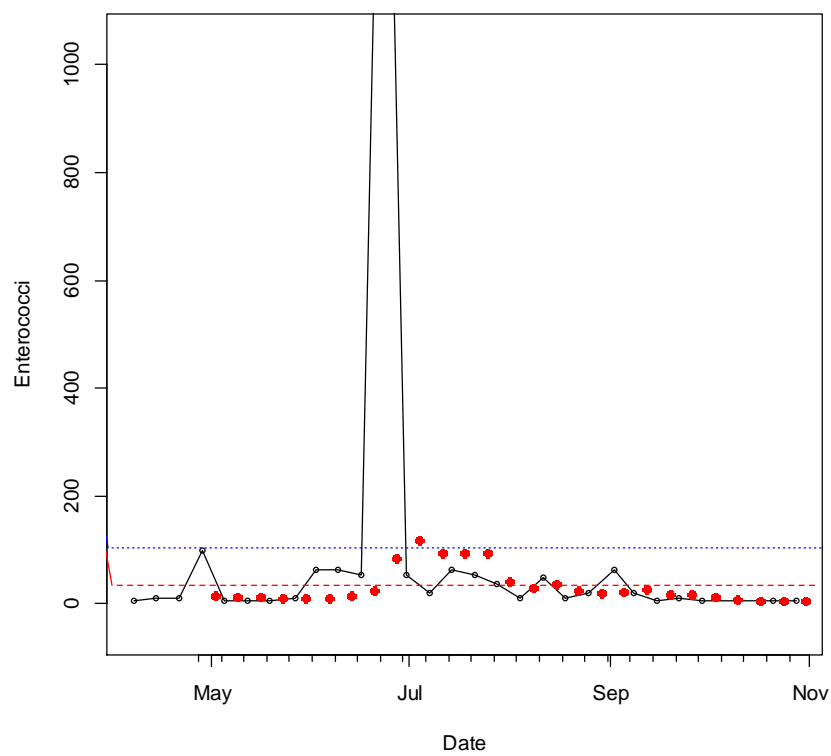
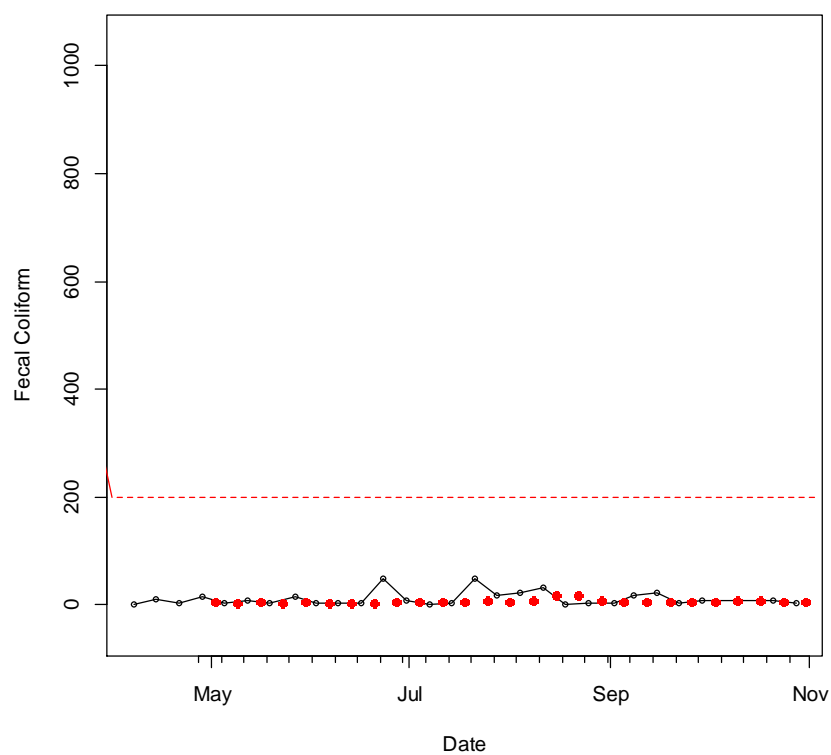


Figure B.22. Time series of sample results collected during 2014 at LTFL1.

A



B

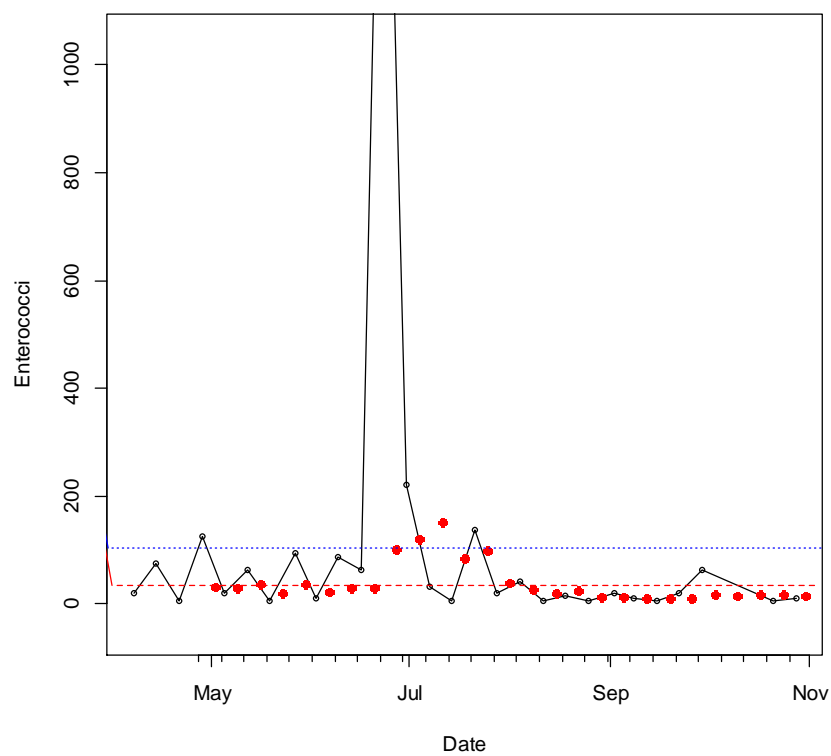
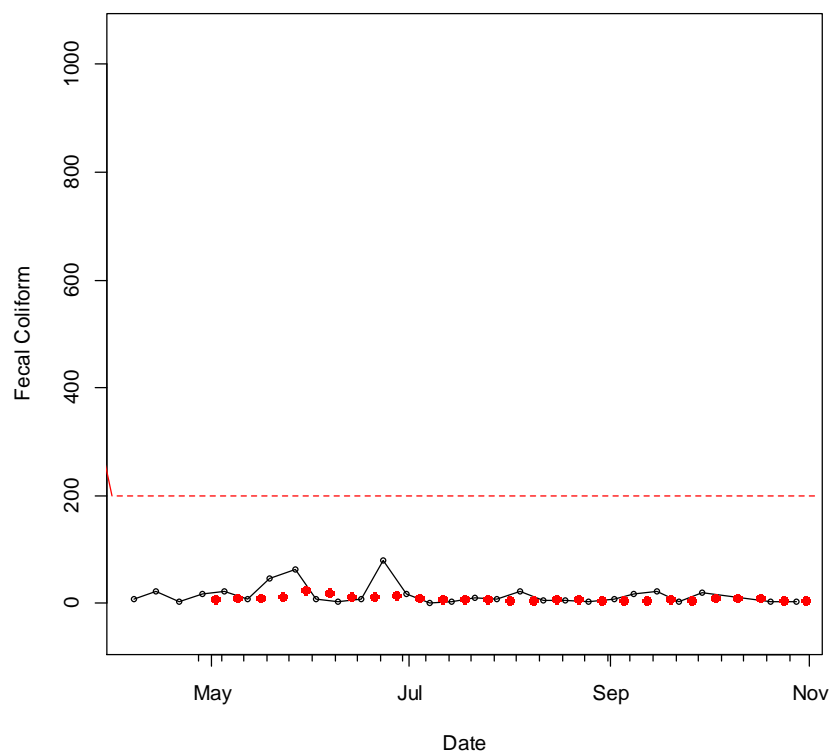


Figure B.23. Time series of sample results collected during 2014 at MART1.

A



B

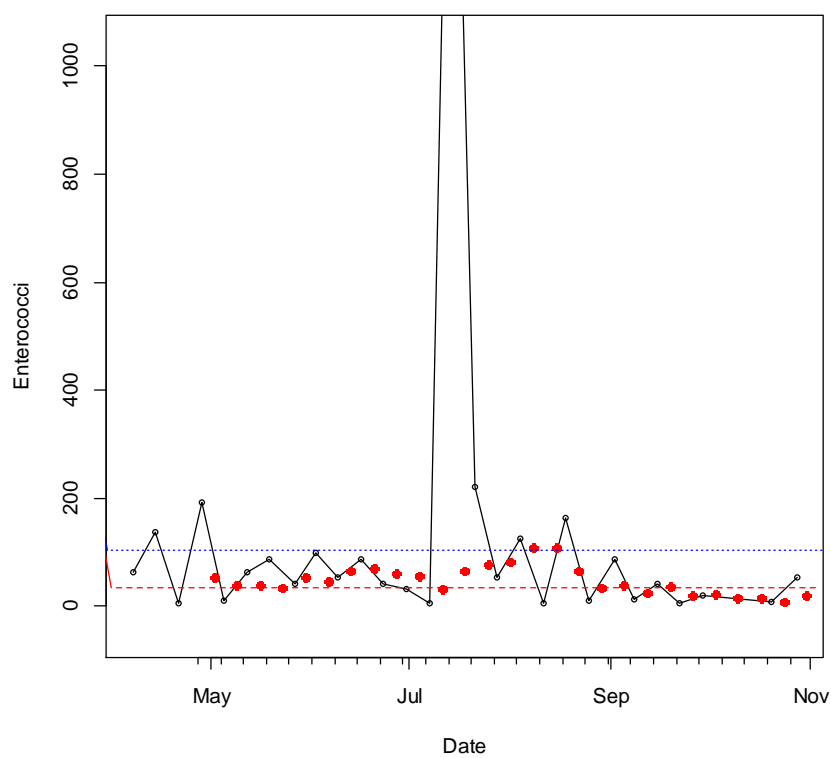


Figure B.24. Time series of sample results collected during 2014 at RUTH1.

APPENDIX C

Sample Results

2014 Beach Sample Results

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
Constance Beach											
<i>CNSTI</i>	<i>Beach Name Constance Beach</i>										
	4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	2	5	22.0	Routine
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	4.5	20	26.0	Field Split
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	2	20	26.0	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.8	Routine
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	75	7.8	124	23.9	Routine
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	13	5	26.3	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	23	42	21.8	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	79	10	21.8	Field Split
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	2	10	24.7	Routine
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	21	31	12.6	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	70	31	15.3	Routine
	6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	81	2	42	19.6	Routine
	6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	83	13	10	23.2	Routine
	6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	33	2005	20.4	Routine
	6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	240	782	22.4	Routine
	7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	42	22.0	Routine
	7/14/2014	7:10	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	11	87	26.8	Routine
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	7.8	20	23.4	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	79	222	27.1	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	170	288	26.9	Field Duplicate
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	170	192	28.4	Routine
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	31	99	28.5	Field Split
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	2	10	29.6	Routine
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	1.8	31	30.2	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	4.5	20	32.1	Routine
	9/2/2014	7:15	High Tide Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	13	124	20.8	Routine
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	33	10	20.9	Routine
	9/15/2014	7:15	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	33	10	21.6	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	9/22/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	22.9	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	2	5	21.9	Routine
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	31	29.5	Routine
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	4.5	10	29.9	Routine

Cypremort Point State Park

CYPT1

Beach Name Cypremort Point State Park

4/7/2014	7:10	Low Tide	Falling	Cloudy	North-Northwest	Moderate-Strong (15-20 mph)	66	31	10	2.1	Routine
4/14/2014	7:15	High Tide		Cloudy	East-Southeast	Strong (20-35 mph)	72	130	384	1.1	Routine
4/21/2014	7:15	Low Tide	Falling	Clear	Northeast	Light (0-5 mph)	70	23	31	1.7	Routine
4/28/2014	7:45	High Tide		Cloudy	South	Moderate-Strong (15-20 mph)	75.8	130	697	2.4	Routine
5/5/2014	8:00	Normal		Clear	South	Moderate-Light (5-10 mph)	70	23	20	2.5	Routine
5/12/2014	8:00	High Tide		Cloudy	East-Southeast	Moderate-Strong (15-20 mph)	78	23	207	3.2	Routine
5/19/2014	8:00	High Tide	Falling	Scattered Clouds	East	Moderate-Light (5-10 mph)	74	33	5	3.7	Routine
5/19/2014	8:00	High Tide	Falling	Scattered Clouds	East	Moderate-Light (5-10 mph)	74	23	5	3.6	Field Split
5/27/2014	8:00	High Tide		Cloudy	South	Moderate-Strong (15-20 mph)	80	170	5	4.5	Routine
6/2/2014	8:00	High Tide		Scattered Clouds	Southeast	Moderate (10-15 mph)	80	64	5	4.5	Routine
6/2/2014	8:00	High Tide		Scattered Clouds	Southeast	Moderate (10-15 mph)	80	11	5	4.5	Field Split
6/9/2014	8:00	High Tide		Scattered Clouds	South	Moderate-Light (5-10 mph)	84	13	20	3.0	Routine
6/16/2014	8:00	High Tide		Cloudy	Southeast	Light (0-5 mph)	82	13	5	3.1	Routine
6/23/2014	8:00	High Tide		Cloudy	Southwest	Moderate (10-15 mph)	83	350	53	2.9	Routine
6/30/2014	8:00	Normal		Clear	South	Light (0-5 mph)	83	4.5	5	2.7	Routine
7/7/2014	8:00	Low Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	86	1	5	2.5	Routine
7/14/2014	8:00	Low Tide	Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	85	2	5	2.0	Routine
7/21/2014	8:00	Low Tide		Cloudy	Calm	Calm (0 mph)	81	49	5	1.7	Routine
7/28/2014	8:00	Low Tide	Falling	Clear	West	Moderate (10-15 mph)	84	130	42	1.6	Routine
8/4/2014	8:00	Normal		Cloudy	Calm	Calm (0 mph)	81	13	5	1.4	Routine
8/11/2014	8:00	High Tide		Cloudy	West	Moderate-Light (5-10 mph)	86	4.5	5	1.9	Routine
8/18/2014	8:00	High Tide	Falling	Scattered Clouds	South	Moderate (10-15 mph)	84	23	20	2.3	Routine
8/25/2014	8:00	High Tide		Scattered Clouds	Northwest	Light (0-5 mph)	87	46	42	1.3	Routine
9/2/2014	8:00	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	83	13	10	3.3	Routine
9/8/2014	8:00	Normal		Scattered Clouds	West-Northwest	Light (0-5 mph)	85	13	5	3.0	Routine
9/15/2014	8:00	Low Tide	Falling	Scattered Clouds	North	Light (0-5 mph)	79	13	10	2.9	Routine
9/22/2014	8:00	High Tide		Scattered Clouds	Calm	Calm (0 mph)	80	17	10	3.1	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	9/29/2014	8:00	High Tide	Falling	Cloudy	Calm	Calm (0 mph)	77	6.8	5	2.9	Routine
	10/20/2014	8:00	High Tide	Falling	Clear	North	Light (0-5 mph)	72	17	42	8.7	Routine
	10/28/2014	8:00	Normal		Scattered Clouds	Calm	Calm (0 mph)	73	1.8	5	7.4	Routine
Elmer's Island												
<i>ELMRI</i>	<i>Beach Name Elmer's Island - 1</i>											
	4/8/2014	6:29	Low Tide		Partly Cloudy	North-Northwest		64	2	20	27.0	Routine
	4/15/2014	7:03	Low Tide		Cloudy	North-Northwest	Strong (20-35 mph)	62	2	20	27.1	Routine
	4/22/2014	6:42	Low Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	70	2	5	23.1	Routine
	4/29/2014	6:22	High Tide	Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	1.8	10	22.8	Routine
	5/6/2014	6:10	Low Tide	Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	70	2	5	30.7	Routine
	5/13/2014	6:11	High Tide	Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	79	42	17.4	Routine
	5/19/2014	6:00	Low Tide	Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	23	10	24.7	Routine
	5/27/2014	6:12	High Tide	Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	20	20	14.7	Routine
	6/3/2014	6:22	Normal		Light Rain	Southeast	Moderate-Light (5-10 mph)	78	2	10	10.7	Routine
	6/10/2014	6:13	High Tide	Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	17	5	24.6	Routine
	6/16/2014	6:18	High Tide	Rising	Partly Cloudy	South	Light (0-5 mph)	78	2	5	20.0	Routine
	6/24/2014	6:17	High Tide	Rising	Scattered Clouds	West	Light (0-5 mph)	83	33	1091	27.5	Routine
	7/1/2014	6:07	Low Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	82	2	5	20.7	Routine
	7/7/2014	6:20	High Tide	Falling	Partly Cloudy	Southwest	Light (0-5 mph)	84	23	42	20.2	Routine
	7/15/2014	6:23	High Tide	Rising	Rain	Southwest	Moderate-Light (5-10 mph)	84	2	87	26.2	Routine
	7/22/2014	6:16	High Tide	Rising	Clear	West	Light (0-5 mph)	84	13	10	17.2	Routine
	7/29/2014	6:23	High Tide	Rising	Cloudy	North	Moderate-Light (5-10 mph)	80	2	5	33.1	Routine
	8/5/2014	6:20	High Tide	Rising	Scattered Clouds	Calm	Calm (0 mph)	86	240	164	15.4	Routine
	8/12/2014	6:21	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	82	7.8	10	24.0	Routine
	8/19/2014	6:18	High Tide		Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	80	2	5	32.7	Routine
	8/26/2014	6:20	High Tide		Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	13	20	25.2	Routine
	9/2/2014	6:18	High Tide	Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	84	2	5	22.0	Routine
	9/9/2014	6:18	Low Tide	Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	27.3	Routine
	9/16/2014	6:27	High Tide	Falling	Rain	Northwest	Light (0-5 mph)	85	7.8	20	23.6	Routine
	9/23/2014	6:19	Normal		Clear	Northeast	Moderate-Strong (15-20 mph)	78	2	5	22.6	Routine
	10/7/2014	6:40	Normal		Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	28.9	Routine
	10/14/2014	6:50	Low Tide		Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	75	2	5	32.1	Routine
	10/21/2014	6:45	Normal		Clear	East-Southeast	Moderate-Light (5-10 mph)	72	2	10	30.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	10/21/2014	6:45	Normal	Clear	East-Southeast	Moderate-Light (5-10 mph)	72	2	10	31.0	Field Split	
	10/28/2014	6:54	Low Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	2	5	26.4	Routine
Fontainebleau State Park												
FNTBI	Beach Name Fontainebleau State Park											
	4/8/2014	9:20	Low Tide	Clear	Calm	Calm (0 mph)	65.3	130	164	2.5	Field Split	
	4/8/2014	9:20	Low Tide	Clear	Calm	Calm (0 mph)	65.3	220	64	2.5	Routine	
	4/14/2014	9:30	Low Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	72.9	350	137	2.4	Field Duplicate
	4/14/2014	9:30	Low Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	72.9	1600	344	2.4	Routine
	4/22/2014	12:48	Low Tide	Cloudy	North	Light (0-5 mph)	70.7	49	5	1.9	Routine	
	4/22/2014	12:48	Low Tide	Cloudy	North	Light (0-5 mph)	70.7	140	10	1.9	Field Split	
	4/29/2014	9:20	Low Tide	Falling	Cloudy	South	Moderate-Light (5-10 mph)	76.5	350	87	1.9	Routine
	5/6/2014	10:20	Low Tide	Falling	Cloudy	South	Moderate (10-15 mph)	74.12	17	5	2.1	Routine
	5/13/2014	9:20	Low Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	77.9	240	75	1.0	Routine
	5/20/2014	9:00	High Tide	Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	76.3	1600	124	1.5	Routine
	5/27/2014	9:25	Low Tide	Falling	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	79.88	920	42	4.5	Routine
	6/3/2014	10:00	Normal	Cloudy	Calm	Calm (0 mph)	78.8	17	5	1.6	Routine	
	6/10/2014	9:40	Low Tide	Falling	Cloudy	South	Moderate-Strong (15-20 mph)	83.66	920	150	0.6	Routine
	6/17/2014	9:38	Low Tide	Scattered Clouds	Southeast	Light (0-5 mph)	83.8	79	20	0.6	Field Split	
	6/17/2014	9:38	Low Tide	Scattered Clouds	Southeast	Light (0-5 mph)	83.8	70	64	0.6	Routine	
	6/24/2014	9:00	Low Tide	Falling	Cloudy	Southwest	Moderate-Light (5-10 mph)	83.8	31	5	0.8	Routine
	7/1/2014	9:05	Low Tide	Scattered Clouds	North-Northwest	Moderate (10-15 mph)	83.3	33	5	0.7	Routine	
	7/15/2014	9:00	Low Tide		Northwest	Moderate (10-15 mph)	82.76	240	344	0.5	Routine	
	7/22/2014	9:30	Low Tide	Falling	Partly Cloudy	Northwest	Light (0-5 mph)	83.12	2	5	0.7	Routine
	7/29/2014	9:20	Low Tide	Cloudy	Northeast	Moderate (10-15 mph)	82.4	2	5	0.5	Routine	
	8/5/2014	9:15	Low Tide	Falling	Clear	North-Northwest	Moderate-Light (5-10 mph)	83.84	23	31	0.8	Routine
	8/11/2014	9:00	Low Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	82.6	33	31	0.8	Routine	
	8/19/2014	9:04	Low Tide	Falling	Clear	West-Northwest	Moderate-Light (5-10 mph)	85.3	17	10	0.7	Routine
	8/26/2014	9:10	Low Tide		East-Northeast	Moderate (10-15 mph)	83.84	23	111	0.8	Routine	
	9/2/2014	9:12	Low Tide	Falling	Variable	Light (0-5 mph)	82.9	33	53	1.2	Routine	
	9/9/2014	9:25	Low Tide	Falling		North	86.54	16	5	1.9	Routine	
	9/16/2014	11:35	Low Tide	Partly Cloudy	Calm	Calm (0 mph)	84.3	4	53	1.7	Routine	
	9/23/2014	9:15	High Tide	Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	77.18	23	20	1.6	Routine
	9/30/2014	8:55	High Tide	Rising	Clear	Northeast	Moderate-Light (5-10 mph)	77.7	4	5	1.5	Routine

Beach Station ID												
	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	10/7/2014	9:30	High Tide	Falling	Clear	Southeast	Light (0-5 mph)	76.1	23	64	1.8	Routine
	10/14/2014	9:52	High Tide	Rising	Clear	West-Northwest	Moderate-Strong (15-20 mph)	72.32	240	429	2.4	Routine
	10/14/2014	9:52	High Tide	Rising	Clear	West-Northwest	Moderate-Strong (15-20 mph)	72.32	350	271	2.3	Field Split
	10/21/2014	9:30	High Tide	Falling	Light Rain	Variable	Light (0-5 mph)	71.06	4.5	5	1.9	Routine
	10/21/2014	9:30	High Tide	Falling	Light Rain	Variable	Light (0-5 mph)	71.06	7.8	10	1.7	Field Split

Grand Isle Beach*GIB1**Beach Name Grand Isle Beach - 1*

4/8/2014	6:29	Low Tide	Partly Cloudy	North-Northwest		64	2	10	26.2	Routine
4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	64	49	20	26.9	Routine
4/22/2014	6:42	Low Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	70	9.3	5	22.1	Routine
4/29/2014	6:22	High Tide Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	49	10	18.4	Routine
5/6/2014	6:10	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	70	2	5	28.4	Routine
5/13/2014	6:11	High Tide Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	6.8	5	17.1	Routine
5/19/2014	6:00	Low Tide Falling	Clear	Southeast	Moderate-Light (5-10 mph)	76	23	5	15.8	Routine
5/27/2014	6:12	High Tide Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	7.8	20	13.0	Routine
6/3/2014	6:22	Normal	Light Rain	Southeast	Moderate-Light (5-10 mph)	78	11	10	10.1	Routine
6/10/2014	6:13	High Tide Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	49	5	23.1	Routine
6/16/2014	6:18	High Tide Rising	Partly Cloudy	South	Light (0-5 mph)	78	33	20	16.9	Routine
6/24/2014	6:17	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	84	13	87	25.8	Routine
7/1/2014	6:07	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	82	2	5	18.8	Routine
7/7/2014	6:20	High Tide Falling	Partly Cloudy	Southwest	Light (0-5 mph)	86	23	5	19.3	Routine
7/15/2014	6:23	High Tide Rising	Rain	Southwest	Moderate-Light (5-10 mph)	80	2	10	26.5	Routine
7/22/2014	6:16	High Tide Rising	Clear	West	Light (0-5 mph)	84	140	5	14.9	Routine
7/29/2014	6:23	High Tide Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	2	10	31.6	Field Duplicate
7/29/2014	6:23	High Tide Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	2	10	31.5	Routine
8/5/2014	6:20	High Tide Rising	Scattered Clouds	Calm	Calm (0 mph)	86	23	53	14.3	Routine
8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	7.8	20	21.3	Routine
8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	82	4	10	30.7	Routine
8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	350	53	24.2	Routine
9/2/2014	6:18	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	84	2	5	21.2	Routine
9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	27.9	Routine
9/16/2014	6:27	High Tide Falling	Rain	Northwest	Light (0-5 mph)	85	2	53	22.4	Routine
9/23/2014	6:19	Normal	Clear	Northeast	Moderate-Strong (15-20 mph)	78	240	137	22.4	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	10/7/2014	6:40	Normal	Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	28.0	Routine
	10/14/2014	6:50	Low Tide	Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	75	7.8	10	30.8	Routine
	10/21/2014	6:45	Normal	Clear	East-Southeast	Moderate-Light (5-10 mph)	72	2	10	32.0	Routine
	10/28/2014	6:54	Low Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	2	5	26.4	Routine
Grand Isle Beach											
<i>GIB2</i>	<i>Beach Name Grand Isle Beach - 2</i>										
	4/8/2014	6:29	Low Tide	Partly Cloudy	North-Northwest		64	2	5	25.5	Routine
	4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	62	49	288	26.4	Routine
	4/22/2014	6:42	Low Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	70	2	5	23.1	Routine
	4/29/2014	6:22	High Tide Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	4.5	111	20.1	Routine
	5/6/2014	6:10	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	70	2	5	29.6	Routine
	5/13/2014	6:11	High Tide Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	33	5	17.7	Routine
	5/19/2014	6:00	Low Tide Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	7.8	5	16.7	Routine
	5/19/2014	6:00	Low Tide Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	7.8	10	16.7	Field Split
	5/27/2014	6:12	High Tide Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	33	20	13.4	Routine
	6/3/2014	6:22	Normal	Light Rain	Southeast	Moderate-Light (5-10 mph)	78	4	5	10.8	Routine
	6/10/2014	6:13	High Tide Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	7.8	5	23.1	Routine
	6/16/2014	6:18	High Tide Rising	Partly Cloudy	South	Light (0-5 mph)	78	17	5	16.8	Routine
	6/24/2014	6:17	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	84	79	87	25.5	Routine
	7/1/2014	6:07	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	82	2	10	18.7	Routine
	7/7/2014	6:20	High Tide Falling	Partly Cloudy	Southwest	Light (0-5 mph)	86	11	10	19.2	Routine
	7/7/2014	6:20	High Tide Falling	Partly Cloudy	Southwest	Light (0-5 mph)	86	4.5	10	19.3	Field Split
	7/15/2014	6:23	High Tide Rising	Rain	Southwest	Moderate-Light (5-10 mph)	80	17	31	26.9	Routine
	7/22/2014	6:16	High Tide Rising	Clear	West	Light (0-5 mph)	84	79	20	15.3	Routine
	7/29/2014	6:23	High Tide Rising	Cloudy	North	Moderate-Light (5-10 mph)	79	2	20	32.4	Routine
	8/5/2014	6:20	High Tide Rising	Scattered Clouds	Calm	Calm (0 mph)	86	49	31	15.0	Routine
	8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	4.5	42	22.4	Routine
	8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	82	11	31	31.0	Routine
	8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	7.8	10	23.9	Routine
	9/2/2014	6:18	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	84	2	5	21.4	Routine
	9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	28.0	Routine
	9/16/2014	6:27	High Tide Falling	Rain	Northwest	Light (0-5 mph)	85	7.8	20	23.9	Routine
	9/23/2014	6:19	Normal	Clear	Northeast	Moderate-Strong (15-20 mph)	78	4.5	20	22.8	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	10/7/2014	6:40	Normal	Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	28.1	Routine
	10/14/2014	6:50	Low Tide	Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	75	7.8	10	30.9	Routine
	10/21/2014	6:45	Normal	Clear	East-Southeast	Moderate-Light (5-10 mph)	72	2	5	32.9	Routine
	10/28/2014	6:54	Low Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	2	5	26.4	Routine
Grand Isle Beach											
<i>GIB3</i>	<i>Beach Name Grand Isle Beach - 3</i>										
	4/8/2014	6:29	Low Tide	Partly Cloudy	North-Northwest		64	6.8	5	21.9	Routine
	4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	62	2	42	26.4	Routine
	4/22/2014	6:42	Low Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	70	2	31	22.1	Routine
	4/29/2014	6:22	High Tide Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	13	10	21.1	Routine
	5/6/2014	6:10	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	71	2	5	27.8	Routine
	5/13/2014	6:11	High Tide Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	2	5	18.0	Routine
	5/19/2014	6:00	Low Tide Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	13	5	17.2	Routine
	5/27/2014	6:12	High Tide Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	13	164	13.1	Routine
	6/3/2014	6:22	Normal	Light Rain	Southeast	Moderate-Light (5-10 mph)	78	1.8	5	11.3	Routine
	6/10/2014	6:13	High Tide Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	4.5	5	23.3	Routine
	6/16/2014	6:18	High Tide Rising	Partly Cloudy	South	Light (0-5 mph)	78	2	5	16.5	Routine
	6/24/2014	6:17	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	84	2	10	25.3	Field Duplicate
	6/24/2014	6:17	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	84	2	20	25.3	Routine
	7/1/2014	6:07	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	82	2	5	19.6	Routine
	7/7/2014	6:20	High Tide Falling	Partly Cloudy	Southwest	Light (0-5 mph)	86	2	10	19.9	Routine
	7/15/2014	6:23	High Tide Rising	Rain	Southwest	Moderate-Light (5-10 mph)	82	13	5	26.0	Routine
	7/15/2014	6:23	High Tide Rising	Rain	Southwest	Moderate-Light (5-10 mph)	82	4.5	5	25.9	Field Split
	7/22/2014	6:16	High Tide Rising	Clear	West	Light (0-5 mph)	84	17	5	16.4	Routine
	7/29/2014	6:23	High Tide Rising	Cloudy	North	Moderate-Light (5-10 mph)	79	2	5	33.2	Routine
	8/5/2014	6:20	High Tide Rising	Scattered Clouds	Calm	Calm (0 mph)	86	13	20	14.8	Routine
	8/5/2014	6:20	High Tide Rising	Scattered Clouds	Calm	Calm (0 mph)	86	14	31	14.8	Field Split
	8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	7.8	5	23.0	Routine
	8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	81	4	26	31.7	Routine
	8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	33	42	23.8	Routine
	9/2/2014	6:18	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	84	2	5	21.1	Routine
	9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	10	28.1	Routine
	9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	28.0	Field Split

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	9/16/2014	6:27	High Tide	Falling	Rain	Northwest	Light (0-5 mph)	85	2	5	24.0	Routine
	9/23/2014	6:19	Normal		Clear	Northeast	Moderate-Strong (15-20 mph)	78	2	64	23.9	Routine
	10/7/2014	6:40	Normal		Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	28.2	Routine
	10/14/2014	6:50	Low Tide		Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	75	2	5	30.4	Routine
	10/21/2014	6:45	Normal		Clear	East-Southeast	Moderate-Light (5-10 mph)	72	2	5	32.5	Routine
	10/28/2014	6:54	Low Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	2	5	26.3	Routine

Grand Isle State Park

GISPI

Beach Name Grand Isle State Park - 1

4/8/2014	6:29	Low Tide	Partly Cloudy	North-Northwest		64	17	10	17.0	Routine
4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	62	110	31	18.0	Routine
4/22/2014	6:42	Low Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	70	4.5	10	19.6	Field Duplicate
4/22/2014	6:42	Low Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	70	2	5	19.6	Routine
4/29/2014	6:22	High Tide Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	49	31	15.8	Routine
5/6/2014	6:10	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	69	13	5	27.7	Routine
5/6/2014	6:10	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	69	22	20	27.8	Field Split
5/13/2014	6:11	High Tide Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	95	20	16.7	Routine
5/19/2014	6:00	Low Tide Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	23	5	17.1	Routine
5/27/2014	6:12	High Tide Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	23	10	12.8	Routine
6/3/2014	6:22	Normal	Light Rain	Southeast	Moderate-Light (5-10 mph)	78	6.8	5	10.2	Routine
6/10/2014	6:13	High Tide Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	33	75	22.5	Routine
6/16/2014	6:18	High Tide Rising	Partly Cloudy	South	Light (0-5 mph)	78	23	10	18.5	Routine
6/24/2014	6:17	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	84	7.8	2005	23.6	Routine
7/1/2014	6:07	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	80	110	20	16.5	Routine
7/7/2014	6:20	High Tide Falling	Partly Cloudy	Southwest	Light (0-5 mph)	85	7.8	10	17.5	Routine
7/15/2014	6:23	High Tide Rising	Rain	Southwest	Moderate-Light (5-10 mph)	80	33	10	17.4	Routine
7/22/2014	6:16	High Tide Rising	Clear	West	Light (0-5 mph)	84	1600	64	12.5	Routine
7/29/2014	6:23	High Tide Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	31	5	23.6	Routine
8/5/2014	6:20	High Tide Rising	Scattered Clouds	Calm	Calm (0 mph)	86	49	42	15.1	Routine
8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	23	5	18.9	Routine
8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	82	33	10	29.1	Routine
8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	1.8	5	25.6	Routine
9/2/2014	6:18	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	7.8	5	20.4	Routine
9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	23.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	9/16/2014	6:27	High Tide	Falling	Rain	Northwest	Light (0-5 mph)	85	13	20	24.4	Routine
	9/23/2014	6:19	Normal		Clear	Northeast	Moderate-Strong (15-20 mph)	78	2	5	21.3	Routine
	10/7/2014	6:40	Normal		Partly Cloudy	South-Southeast	Light (0-5 mph)	75	4.5	5	26.0	Routine
	10/14/2014	6:50	Low Tide		Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	72	2	5	26.0	Routine
	10/21/2014	6:45	Normal		Clear	East-Southeast	Moderate-Light (5-10 mph)	69	2	5	30.6	Routine
	10/28/2014	6:54	Low Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	4	5	26.9	Routine

Grand Isle State Park

GISP2

Beach Name Grand Isle State Park - 2

4/8/2014	6:29	Low Tide	Partly Cloudy	North-Northwest		64	4.5	5	21.2	Routine	
4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	58	350	150	16.7	Routine	
4/22/2014	6:42	Low Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	69	4	10	19.9	Routine
4/29/2014	6:22	High Tide	Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	1600	384	18.0	Routine
5/6/2014	6:10	Low Tide	Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	69	7.8	31	27.7	Routine
5/13/2014	6:11	High Tide	Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	130	20	16.7	Routine
5/19/2014	6:00	Low Tide	Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	49	5	18.2	Routine
5/27/2014	6:12	High Tide	Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	33	20	13.0	Routine
6/3/2014	6:22	Normal	Light Rain	Southeast	Moderate-Light (5-10 mph)	78	6.8	5	10.3	Routine	
6/10/2014	6:13	High Tide	Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	33	10	22.5	Routine
6/16/2014	6:18	High Tide	Rising	Partly Cloudy	South	Light (0-5 mph)	78	79	87	18.9	Routine
6/24/2014	6:17	High Tide	Rising	Scattered Clouds	West	Light (0-5 mph)	84	26	364	24.0	Routine
7/1/2014	6:07	Low Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	79	23	5	16.7	Routine
7/7/2014	6:20	High Tide	Falling	Partly Cloudy	Southwest	Light (0-5 mph)	85	23	5	17.8	Routine
7/15/2014	6:23	High Tide	Rising	Rain	Southwest	Moderate-Light (5-10 mph)	79	350	53	20.4	Routine
7/22/2014	6:16	High Tide	Rising	Clear	West	Light (0-5 mph)	84	350	64	12.8	Routine
7/29/2014	6:23	High Tide	Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	7.8	5	23.3	Field Split
7/29/2014	6:23	High Tide	Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	11	5	23.4	Routine
8/5/2014	6:20	High Tide	Rising	Scattered Clouds	Calm	Calm (0 mph)	86	49	5	15.5	Routine
8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	78	23	10	20.6	Routine	
8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	82	17	20	28.1	Routine	
8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	7.8	31	25.5	Routine	
9/2/2014	6:18	High Tide	Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	7.8	20	20.5	Routine
9/9/2014	6:18	Low Tide	Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	24.2	Routine
9/16/2014	6:27	High Tide	Falling	Rain	Northwest	Light (0-5 mph)	85	23	10	23.2	Field Duplicate

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	9/16/2014	6:27	High Tide	Falling	Rain	Northwest	Light (0-5 mph)	85	23	5	23.3	Routine
	9/23/2014	6:19	Normal		Clear	Northeast	Moderate-Strong (15-20 mph)	78	4.5	5	21.3	Routine
	10/7/2014	6:40	Normal		Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	27.4	Routine
	10/7/2014	6:40	Normal		Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	27.2	Field Split
	10/14/2014	6:50	Low Tide		Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	72	6.8	10	29.6	Routine
	10/21/2014	6:45	Normal		Clear	East-Southeast	Moderate-Light (5-10 mph)	69	2	10	30.5	Routine
	10/28/2014	6:54	Low Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	11	5	26.6	Routine
	10/28/2014	6:54	Low Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	4.5	5	26.6	Field Split

Grand Isle State Park

GISP3

Beach Name Grand Isle State Park - 3

4/8/2014	6:29	Low Tide		Partly Cloudy	North-Northwest		64	2	10	22.3	Routine
4/15/2014	7:03	Low Tide		Cloudy	North-Northwest	Strong (20-35 mph)	62	240	99	17.4	Routine
4/22/2014	6:42	Low Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	69	7.8	10	21.1	Field Split
4/22/2014	6:42	Low Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	69	13	5	20.3	Routine
4/29/2014	6:22	High Tide	Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	79	20	16.5	Routine
4/29/2014	6:22	High Tide	Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	33	31	16.5	Field Duplicate
5/6/2014	6:10	Low Tide	Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	68	4.5	5	27.8	Routine
5/13/2014	6:11	High Tide	Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	240	31	16.8	Routine
5/19/2014	6:00	Low Tide	Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	49	10	18.7	Field Split
5/19/2014	6:00	Low Tide	Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	79	64	18.8	Routine
5/27/2014	6:12	High Tide	Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	33	31	12.8	Routine
6/3/2014	6:22	Normal		Light Rain	Southeast	Moderate-Light (5-10 mph)	78	13	5	10.4	Routine
6/10/2014	6:13	High Tide	Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	33	10	22.5	Routine
6/16/2014	6:18	High Tide	Rising	Partly Cloudy	South	Light (0-5 mph)	78	46	10	19.3	Routine
6/24/2014	6:17	High Tide	Rising	Scattered Clouds	West	Light (0-5 mph)	84	33	2005	24.4	Routine
7/1/2014	6:07	Low Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	78	130	64	16.9	Routine
7/7/2014	6:20	High Tide	Falling	Partly Cloudy	Southwest	Light (0-5 mph)	84	2	5	18.5	Routine
7/7/2014	6:20	High Tide	Falling	Partly Cloudy	Southwest	Light (0-5 mph)	84	6.8	10	18.6	Field Split
7/15/2014	6:23	High Tide	Rising	Rain	Southwest	Moderate-Light (5-10 mph)	78	1600	782	22.8	Routine
7/22/2014	6:16	High Tide	Rising	Clear	West	Light (0-5 mph)	84	920	20	12.9	Routine
7/22/2014	6:16	High Tide	Rising	Clear	West	Light (0-5 mph)	84	1600	31	12.9	Field Duplicate
7/29/2014	6:23	High Tide	Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	49	5	24.3	Routine
8/5/2014	6:20	High Tide	Rising	Scattered Clouds	Calm	Calm (0 mph)	86	49	10	15.4	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	78	13	5	20.9	Routine
	8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	82	31	10	29.4	Routine
	8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	82	33	20	29.2	Field Split
	8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	2	5	25.4	Routine
	9/2/2014	6:18	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	4.5	10	20.8	Routine
	9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	24.3	Routine
	9/16/2014	6:27	High Tide Falling	Rain	Northwest	Light (0-5 mph)	85	4.5	20	23.1	Routine
	9/23/2014	6:19	Normal	Clear	Northeast	Moderate-Strong (15-20 mph)	78	2	10	21.5	Routine
	10/7/2014	6:40	Normal	Partly Cloudy	South-Southeast	Light (0-5 mph)	75	2	5	27.6	Field Split
	10/7/2014	6:40	Normal	Partly Cloudy	South-Southeast	Light (0-5 mph)	75	7.8	5	27.2	Routine
	10/14/2014	6:50	Low Tide	Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	72	4.5	31	30.5	Routine
	10/21/2014	6:45	Normal	Clear	East-Southeast	Moderate-Light (5-10 mph)	69	2	5	30.5	Field Duplicate
	10/21/2014	6:45	Normal	Clear	East-Southeast	Moderate-Light (5-10 mph)	69	4.5	5	30.6	Routine
	10/28/2014	6:54	Low Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	7.8	10	26.6	Routine

Grand Isle State Park

GISP4

Beach Name Grand Isle State Park - 4

	4/8/2014	6:29	Low Tide	Partly Cloudy	North-Northwest		64	2	10	24.4	Routine
	4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	62	1600	222	16.4	Field Split
	4/15/2014	7:03	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	62	1600	271	16.4	Routine
	4/22/2014	6:42	Low Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	68	13	5	21.9	Routine
	4/29/2014	6:22	High Tide Falling	Cloudy	South-Southwest	Moderate-Strong (15-20 mph)	76	22	10	16.3	Routine
	5/6/2014	6:10	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	68	13	5	27.9	Routine
	5/13/2014	6:11	High Tide Rising	Scattered Clouds	Southeast	Moderate (10-15 mph)	79	130	53	16.8	Routine
	5/19/2014	6:00	Low Tide Falling	Clear	Southeast	Moderate-Light (5-10 mph)	75	79	42	18.0	Routine
	5/27/2014	6:12	High Tide Rising	Cloudy	Southeast	Moderate-Light (5-10 mph)	84	49	10	12.6	Routine
	6/3/2014	6:22	Normal	Light Rain	Southeast	Moderate-Light (5-10 mph)	78	49	5	10.3	Routine
	6/10/2014	6:13	High Tide Rising	Partly Cloudy	South	Moderate-Strong (15-20 mph)	82	7.8	20	22.6	Routine
	6/16/2014	6:18	High Tide Rising	Partly Cloudy	South	Light (0-5 mph)	78	4.5	10	18.1	Field Duplicate
	6/16/2014	6:18	High Tide Rising	Partly Cloudy	South	Light (0-5 mph)	78	23	10	18.1	Routine
	6/24/2014	6:17	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	84	170	2005	24.9	Routine
	7/1/2014	6:07	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	79	170	5	16.5	Routine
	7/7/2014	6:20	High Tide Falling	Partly Cloudy	Southwest	Light (0-5 mph)	84	11	20	18.4	Routine
	7/15/2014	6:23	High Tide Rising	Rain	Southwest	Moderate-Light (5-10 mph)	78	13	20	22.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/22/2014	6:16	High Tide Rising	Clear	West	Light (0-5 mph)	84	240	10	13.0	Routine
	7/29/2014	6:23	High Tide Rising	Cloudy	North	Moderate-Light (5-10 mph)	82	23	53	24.1	Routine
	8/5/2014	6:20	High Tide Rising	Scattered Clouds	Calm	Calm (0 mph)	85	95	20	15.1	Routine
	8/12/2014	6:21	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	78	23	10	21.1	Routine
	8/19/2014	6:18	High Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	80	33	64	29.6	Routine
	8/26/2014	6:20	High Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	82	4.5	20	25.3	Routine
	9/2/2014	6:18	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	13	5	21.0	Routine
	9/9/2014	6:18	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	85	2	5	24.7	Routine
	9/16/2014	6:27	High Tide Falling	Rain	Northwest	Light (0-5 mph)	85	4.5	5	23.2	Routine
	9/23/2014	6:19	Normal	Clear	Northeast	Moderate-Strong (15-20 mph)	78	2	10	21.5	Routine
	10/7/2014	6:40	Normal	Partly Cloudy	South-Southeast	Light (0-5 mph)	75	4.5	5	27.8	Routine
	10/7/2014	6:40	Normal	Partly Cloudy	South-Southeast	Light (0-5 mph)	75	1.8	5	27.8	Field Duplicate
	10/14/2014	6:50	Low Tide	Scattered Clouds	North-Northwest	Moderate-Strong (15-20 mph)	72	2	10	30.5	Routine
	10/21/2014	6:45	Normal	Clear	East-Southeast	Moderate-Light (5-10 mph)	68	2	5	30.6	Routine
	10/28/2014	6:54	Low Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	2	10	26.6	Routine
	10/28/2014	6:54	Low Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	74	11	20	26.6	Field Duplicate

Gulf Breeze*GBRZI**Beach Name Gulf Breeze*

	4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	2	5	22.1	Routine
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	7.8	42	26.0	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.7	Routine
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	75	3.7	42	23.7	Routine
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	13	5	26.3	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	9.3	5	22.3	Routine
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	2	10	24.7	Field Split
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	2	5	24.7	Routine
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	17	10	12.6	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	33	42	15.3	Routine
	6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	81	6.8	42	19.7	Routine
	6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	83	33	99	23.1	Routine
	6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	23	2005	20.5	Routine
	6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	70	207	22.3	Routine
	7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	20	22.1	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	7.8	42	26.9	Routine
	7/21/2014	7:00	Normal		Scattered Clouds	South	Light (0-5 mph)	85	9.3	75	23.7	Routine
	7/28/2014	7:00	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	85	130	178	26.9	Routine
	8/4/2014	7:15	High Tide		Partly Cloudy	Northeast	Light (0-5 mph)	85	33	222	28.6	Routine
	8/11/2014	7:00	Normal		Scattered Clouds	Southwest	Light (0-5 mph)	86	2.3	20	29.6	Routine
	8/18/2014	7:00	High Tide		Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	10	30.3	Routine
	8/25/2014	7:15	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	87	2	5	31.7	Routine
	9/2/2014	7:15	High Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	13	20	21.0	Routine
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	2	10	21.0	Routine
	9/15/2014	7:15	Low Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	10	21.4	Routine
	9/22/2014	7:30	Low Tide		Scattered Clouds	North-Northeast	Light (0-5 mph)	83	4.5	5	23.0	Routine
	9/29/2014	7:10	Normal		Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	2	20	21.9	Routine
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	4.5	5	29.6	Routine
	10/28/2014	9:56	Normal		Cloudy	South	Moderate-Light (5-10 mph)	75	2	20	29.9	Routine

Holly Beach*HOLLYI**Beach Name Holly Beach - 1*

	4/7/2014	7:10	Normal		Cloudy	North	Moderate (10-15 mph)	64	2	20	22.0	Routine
	4/14/2014	7:05	Normal		Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	6.8	87	26.8	Routine
	4/21/2014	7:00	High Tide		Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.5	Routine
	4/28/2014	7:00	High Tide		Cloudy	North	Strong (20-35 mph)	74	49	222	22.1	Routine
	5/5/2014	7:00	Normal		Scattered Clouds	Southwest	Moderate (10-15 mph)	73	6.8	5	25.4	Routine
	5/12/2014	7:00	Low Tide		Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	2	10	20.1	Field Duplicate
	5/12/2014	7:00	Low Tide		Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	14	53	20.2	Routine
	5/19/2014	7:15	High Tide		Scattered Clouds	South	Moderate (10-15 mph)	76	2	5	24.0	Routine
	5/27/2014	6:45	Normal		Cloudy	South	Moderate (10-15 mph)	80	49	10	11.1	Routine
	6/2/2014	6:45	High Tide		Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	33	5	14.4	Routine
	6/9/2014	6:45	Normal		Scattered Clouds	South	Moderate (10-15 mph)	80	17	20	18.2	Routine
	6/16/2014	7:00	High Tide		Scattered Clouds	South-Southeast	Moderate (10-15 mph)	82	4	75	23.0	Routine
	6/23/2014	7:00	Normal		Cloudy	South	Moderate-Light (5-10 mph)	83	33	2005	18.9	Routine
	6/30/2014	7:00	High Tide		Scattered Clouds	South	Moderate-Light (5-10 mph)	84	130	75	21.6	Routine
	7/7/2014	7:45	High Tide	Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	10	21.8	Routine
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	33	150	25.9	Field Duplicate
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	70	207	26.0	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	2	64	23.4	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	13	31	27.4	Routine
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	27	31	25.9	Routine
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	33	10	28.9	Routine
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	42	29.9	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	23	10	32.1	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	33	10	31.6	Field Split
	9/2/2014	7:15	High Tide Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	10	19.9	Routine
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	17	5	17.1	Routine
	9/15/2014	7:15	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	33	31	22.0	Routine
	9/22/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	21.9	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	6.8	10	21.2	Routine
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	5	28.9	Field Split
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	20	28.9	Routine
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	2	5	29.0	Routine

Holly Beach*HOLLY2**Beach Name Holly Beach - 2*

	4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	2	42	22.1	Routine
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	17	64	26.8	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.4	Routine
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	74	17	306	22.3	Routine
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	13	42	25.4	Field Split
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	17	10	25.5	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	13	10	20.2	Routine
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	170	10	24.1	Routine
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	23	20	11.1	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	23	10	14.2	Routine
	6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	80	13	20	18.3	Routine
	6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	82	13	164	22.9	Routine
	6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	49	2005	19.1	Routine
	6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	540	64	21.4	Routine
	7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	10	21.8	Routine
	7/14/2014	7:10	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	13	42	26.0	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	4.5	99	23.3	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	23	31	27.4	Routine
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	7.8	42	25.6	Routine
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	7.8	10	28.9	Routine
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	31	29.9	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	46	5	31.8	Routine
	9/2/2014	7:15	High Tide Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	20	19.9	Routine
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	33	20	17.1	Field Split
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	79	5	17.1	Routine
	9/15/2014	7:15	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	33	5	22.4	Routine
	9/22/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	83	1.8	5	22.3	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	11	5	21.2	Routine
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	10	28.9	Routine
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	2	10	29.0	Routine

Holly Beach*HOLLY3**Beach Name Holly Beach - 3*

	4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	2	5	21.8	Routine
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	17	87	27.2	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.2	Routine
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	74	17	178	22.4	Routine
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	6.8	31	25.5	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	11	31	20.2	Routine
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	33	10	24.0	Routine
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	49	10	10.0	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	79	64	14.4	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	70	42	14.4	Field Split
	6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	80	7.8	42	18.5	Routine
	6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	82	22	344	22.9	Routine
	6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	70	2005	19.1	Routine
	6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	240	75	21.2	Routine
	7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	53	22.0	Routine
	7/14/2014	7:10	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	23	42	26.0	Routine
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	4.5	99	23.3	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	11	64	23.3	Field Split
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	17	87	27.3	Routine
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	79	31	25.7	Routine
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	33	31	28.9	Routine
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	27	10	29.0	Field Duplicate
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	20	29.9	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	7.8	10	31.7	Routine
	9/2/2014	7:15	High Tide Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	53	19.8	Routine
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	49	42	17.6	Routine
	9/15/2014	7:15	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	10	22.4	Routine
	9/22/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	22.2	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	2	31	21.3	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	23	20	21.2	Field Duplicate
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	4.5	5	29.0	Routine
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	2	5	29.4	Routine

Holly Beach

HOLLY4

Beach Name Holly Beach - 4

4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	2	31	21.5	Routine
4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	4	137	26.9	Routine
4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.4	Routine
4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	74	240	222	22.3	Routine
5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	7.8	5	25.4	Routine
5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	33	20	17.2	Routine
5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	33	20	24.0	Routine
5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	23	20	11.1	Routine
6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	33	10	14.4	Routine
6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	80	45	42	18.7	Routine
6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	82	17	192	22.9	Routine
6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	33	2005	19.2	Routine
6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	540	15	21.1	Routine
7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	10	22.0	Routine
7/14/2014	7:10	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	2.8	31	26.1	Routine
7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	4.5	64	23.4	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	7/28/2014	7:00	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	85	23	53	27.3	Routine
	8/4/2014	7:15	High Tide		Partly Cloudy	Northeast	Light (0-5 mph)	85	4.5	10	26.5	Field Split
	8/4/2014	7:15	High Tide		Partly Cloudy	Northeast	Light (0-5 mph)	85	17	10	26.6	Routine
	8/11/2014	7:00	Normal		Scattered Clouds	Southwest	Light (0-5 mph)	86	220	20	29.0	Routine
	8/18/2014	7:00	High Tide		Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	4.5	20	30.0	Routine
	8/25/2014	7:15	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	87	3.1	5	31.8	Routine
	9/2/2014	7:15	High Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	10	19.7	Routine
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	49	31	17.9	Routine
	9/15/2014	7:15	Low Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	20	22.6	Routine
	9/22/2014	7:30	Low Tide		Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	22.4	Routine
	9/29/2014	7:10	Normal		Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	2	10	21.5	Routine
	9/29/2014	7:10	Normal		Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	6.8	10	21.5	Field Split
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	10	29.1	Routine
	10/28/2014	9:56	Normal		Cloudy	South	Moderate-Light (5-10 mph)	75	2	10	29.5	Routine

Holly Beach*HOLLY5**Beach Name Holly Beach - 5*

	4/7/2014	7:10	Normal		Cloudy	North	Moderate (10-15 mph)	64	2	42	21.5	Routine
	4/14/2014	7:05	Normal		Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	17	111	26.9	Routine
	4/21/2014	7:00	High Tide		Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.3	Field Duplicate
	4/21/2014	7:00	High Tide		Scattered Clouds	East-Southeast	Light (0-5 mph)	72	4	5	25.4	Routine
	4/28/2014	7:00	High Tide		Cloudy	North	Strong (20-35 mph)	74	23	75	22.5	Routine
	5/5/2014	7:00	Normal		Scattered Clouds	Southwest	Moderate (10-15 mph)	73	7.8	53	25.9	Routine
	5/12/2014	7:00	Low Tide		Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	11	20	20.2	Routine
	5/19/2014	7:15	High Tide		Scattered Clouds	South	Moderate (10-15 mph)	76	33	5	24.0	Field Duplicate
	5/19/2014	7:15	High Tide		Scattered Clouds	South	Moderate (10-15 mph)	76	49	5	24.0	Routine
	5/27/2014	6:45	Normal		Cloudy	South	Moderate (10-15 mph)	80	23	5	11.0	Routine
	5/27/2014	6:45	Normal		Cloudy	South	Moderate (10-15 mph)	80	49	10	11.1	Field Duplicate
	6/2/2014	6:45	High Tide		Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	2	53	14.4	Routine
	6/9/2014	6:45	Normal		Scattered Clouds	South	Moderate (10-15 mph)	80	23	64	18.7	Routine
	6/16/2014	7:00	High Tide		Scattered Clouds	South-Southeast	Moderate (10-15 mph)	82	13	64	23.0	Routine
	6/23/2014	7:00	Normal		Cloudy	South	Moderate-Light (5-10 mph)	83	70	2005	19.2	Routine
	6/30/2014	7:00	High Tide		Scattered Clouds	South	Moderate-Light (5-10 mph)	84	79	42	21.1	Routine
	7/7/2014	7:45	High Tide	Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	20	21.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	23	20	26.1	Routine
	7/21/2014	7:00	Normal		Scattered Clouds	South	Light (0-5 mph)	85	6.8	99	23.4	Routine
	7/21/2014	7:00	Normal		Scattered Clouds	South	Light (0-5 mph)	85	7.8	87	23.4	Field Split
	7/28/2014	7:00	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	85	7.8	99	27.3	Routine
	8/4/2014	7:15	High Tide		Partly Cloudy	Northeast	Light (0-5 mph)	85	22	20	27.1	Routine
	8/11/2014	7:00	Normal		Scattered Clouds	Southwest	Light (0-5 mph)	86	23	53	28.9	Routine
	8/18/2014	7:00	High Tide		Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	14	10	29.8	Routine
	8/25/2014	7:15	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	87	23	5	31.9	Routine
	9/2/2014	7:15	High Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	20	19.7	Routine
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	23	31	17.9	Field Duplicate
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	23	10	18.0	Routine
	9/15/2014	7:15	Low Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	5	22.6	Routine
	9/22/2014	7:30	Low Tide		Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	22.2	Routine
	9/29/2014	7:10	Normal		Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	7.8	10	21.5	Routine
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	20	29.0	Routine
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	20	29.0	Field Split
	10/28/2014	9:56	Normal		Cloudy	South	Moderate-Light (5-10 mph)	75	2	53	29.4	Routine

Holly Beach*HOLLY6**Beach Name Holly Beach - 6*

	4/7/2014	7:10	Normal		Cloudy	North	Moderate (10-15 mph)	64	2	10	21.5	Routine
	4/14/2014	7:05	Normal		Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	14	150	27.1	Routine
	4/21/2014	7:00	High Tide		Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	25.3	Routine
	4/28/2014	7:00	High Tide		Cloudy	North	Strong (20-35 mph)	74	17	164	22.5	Routine
	5/5/2014	7:00	Normal		Scattered Clouds	Southwest	Moderate (10-15 mph)	73	2	10	26.2	Routine
	5/12/2014	7:00	Low Tide		Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	23	111	20.3	Routine
	5/19/2014	7:15	High Tide		Scattered Clouds	South	Moderate (10-15 mph)	76	49	10	23.9	Routine
	5/27/2014	6:45	Normal		Cloudy	South	Moderate (10-15 mph)	80	49	5	11.1	Routine
	6/2/2014	6:45	High Tide		Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	350	53	14.4	Routine
	6/9/2014	6:45	Normal		Scattered Clouds	South	Moderate (10-15 mph)	80	23	31	18.6	Routine
	6/16/2014	7:00	High Tide		Scattered Clouds	South-Southeast	Moderate (10-15 mph)	82	13	164	22.9	Routine
	6/23/2014	7:00	Normal		Cloudy	South	Moderate-Light (5-10 mph)	83	79	2005	19.3	Routine
	6/30/2014	7:00	High Tide		Scattered Clouds	South	Moderate-Light (5-10 mph)	84	350	111	21.1	Routine
	7/7/2014	7:45	High Tide	Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	31	22.0	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	26	5	26.1	Routine
	7/21/2014	7:00	Normal		Scattered Clouds	South	Light (0-5 mph)	85	13	111	23.5	Routine
	7/28/2014	7:00	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	85	4	53	27.4	Routine
	8/4/2014	7:15	High Tide		Partly Cloudy	Northeast	Light (0-5 mph)	85	33	42	27.6	Routine
	8/11/2014	7:00	Normal		Scattered Clouds	Southwest	Light (0-5 mph)	86	14	42	28.8	Routine
	8/18/2014	7:00	High Tide		Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	4.5	31	29.9	Routine
	8/25/2014	7:15	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	87	2	5	31.9	Routine
	9/2/2014	7:15	High Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	10	19.7	Routine
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	33	64	18.0	Routine
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	46	10	18.0	Field Split
	9/15/2014	7:15	Low Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	10	22.6	Routine
	9/22/2014	7:30	Low Tide		Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	22.4	Routine
	9/29/2014	7:10	Normal		Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	4.5	10	21.4	Routine
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	10	29.0	Routine
	10/28/2014	9:56	Normal		Cloudy	South	Moderate-Light (5-10 mph)	75	2	10	29.7	Routine

Little Florida

LTFLI

Beach Name Little Florida

	4/7/2014	7:10	Normal		Cloudy	North	Moderate (10-15 mph)	64	2	5	22.2	Routine
	4/14/2014	7:05	Normal		Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	2	10	26.0	Routine
	4/21/2014	7:00	High Tide		Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	10	26.0	Routine
	4/28/2014	7:00	High Tide		Cloudy	North	Strong (20-35 mph)	75	7.8	99	23.8	Routine
	5/5/2014	7:00	Normal		Scattered Clouds	Southwest	Moderate (10-15 mph)	73	23	5	26.2	Routine
	5/12/2014	7:00	Low Tide		Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	7.8	5	22.7	Routine
	5/19/2014	7:15	High Tide		Scattered Clouds	South	Moderate (10-15 mph)	76	2	5	24.6	Routine
	5/27/2014	6:45	Normal		Cloudy	South	Moderate (10-15 mph)	80	23	10	12.9	Routine
	6/2/2014	6:45	High Tide		Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	49	64	15.3	Routine
	6/9/2014	6:45	Normal		Scattered Clouds	South	Moderate (10-15 mph)	81	6.8	64	19.7	Routine
	6/16/2014	7:00	High Tide		Scattered Clouds	South-Southeast	Moderate (10-15 mph)	83	4.5	53	23.2	Routine
	6/23/2014	7:00	Normal		Cloudy	South	Moderate-Light (5-10 mph)	83	49	2005	19.5	Routine
	6/23/2014	7:00	Normal		Cloudy	South	Moderate-Light (5-10 mph)	83	4.5	2005	19.4	Field Split
	6/30/2014	7:00	High Tide		Scattered Clouds	South	Moderate-Light (5-10 mph)	84	23	53	22.3	Routine
	7/7/2014	7:45	High Tide	Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	20	22.1	Routine
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	7.8	64	27.0	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	17	53	23.6	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	33	42	27.5	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	11	31	27.5	Field Split
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	23	10	29.0	Routine
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	13	42	29.6	Field Split
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	22	53	29.7	Routine
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	4.5	10	30.3	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	2	20	32.0	Routine
	9/2/2014	7:15	High Tide Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	64	21.0	Routine
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	2	20	21.4	Routine
	9/15/2014	7:15	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	5	21.5	Routine
	9/22/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	10	23.0	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	2	5	21.8	Routine
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	5	29.6	Routine
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	2	5	30.0	Field Split
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	2	5	29.9	Routine

Long Beach*DUNGI**Beach Name Long Beach*

	4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	2	20	22.9	Routine
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	4.5	20	26.0	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	4	5	25.9	Routine
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	75	33	238	24.0	Routine
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	7.8	20	26.3	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	46	20	23.2	Routine
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	2	5	24.4	Routine
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	130	53	13.1	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	23	53	16.0	Routine
	6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	81	4.5	42	19.9	Routine
	6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	83	2	697	23.2	Routine
	6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	17	2005	19.0	Routine
	6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	13	31	22.4	Routine
	7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	99	21.7	Routine
	7/14/2014	7:10	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	13	10	27.0	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/21/2014	7:00	Normal	Scattered Clouds	South	Light (0-5 mph)	85	7.8	20	24.3	Routine
	7/28/2014	7:00	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	85	7.8	42	27.6	Routine
	8/4/2014	7:15	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	85	13	254	29.2	Routine
	8/11/2014	7:00	Normal	Scattered Clouds	Southwest	Light (0-5 mph)	86	17	31	29.7	Routine
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	10	30.2	Field Duplicate
	8/18/2014	7:00	High Tide	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	20	30.4	Routine
	8/25/2014	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	87	2	5	31.8	Routine
	9/2/2014	7:15	High Tide Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	17	20	21.1	Routine
	9/8/2014	7:00	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	33	20	20.5	Routine
	9/15/2014	7:15	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	5	21.6	Routine
	9/22/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	5	23.0	Routine
	9/29/2014	7:10	Normal	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	2	5	21.8	Routine
	10/21/2014	7:15	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	20	29.7	Routine
	10/28/2014	9:56	Normal	Cloudy	South	Moderate-Light (5-10 mph)	75	1.8	10	29.9	Routine

Martin Beach

MARTI

Beach Name Martin Beach

	4/7/2014	7:10	Normal	Cloudy	North	Moderate (10-15 mph)	64	1.8	20	23.2	Routine
	4/14/2014	7:05	Normal	Partly Cloudy	South	Moderate-Strong (15-20 mph)	72	11	75	25.9	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	23.4	Routine
	4/21/2014	7:00	High Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	72	2	5	23.0	Field Duplicate
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	75	11	124	24.2	Routine
	4/28/2014	7:00	High Tide	Cloudy	North	Strong (20-35 mph)	75	17	124	24.2	Field Split
	5/5/2014	7:00	Normal	Scattered Clouds	Southwest	Moderate (10-15 mph)	73	2	20	26.8	Routine
	5/12/2014	7:00	Low Tide	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	76	7.8	64	23.4	Routine
	5/19/2014	7:15	High Tide	Scattered Clouds	South	Moderate (10-15 mph)	76	2	5	24.4	Routine
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	23	75	12.9	Field Duplicate
	5/27/2014	6:45	Normal	Cloudy	South	Moderate (10-15 mph)	80	7.8	111	12.9	Routine
	6/2/2014	6:45	High Tide	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	80	2	10	17.0	Routine
	6/9/2014	6:45	Normal	Scattered Clouds	South	Moderate (10-15 mph)	81	2	87	20.4	Routine
	6/16/2014	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	83	2	64	23.4	Routine
	6/23/2014	7:00	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	49	2005	19.1	Routine
	6/30/2014	7:00	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	84	7.8	222	23.1	Routine
	7/7/2014	7:45	High Tide Falling	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	1	31	22.5	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	7/14/2014	7:10	High Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	85	2	5	27.1	Routine
	7/21/2014	7:00	Normal		Scattered Clouds	South	Light (0-5 mph)	85	49	137	23.4	Routine
	7/28/2014	7:00	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	85	17	20	28.2	Routine
	8/4/2014	7:15	High Tide		Partly Cloudy	Northeast	Light (0-5 mph)	85	22	42	29.4	Routine
	8/11/2014	7:00	Normal		Scattered Clouds	Southwest	Light (0-5 mph)	86	33	5	29.9	Routine
	8/18/2014	7:00	High Tide		Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	2	10	29.2	Field Duplicate
	8/18/2014	7:00	High Tide		Scattered Clouds	South-Southwest	Moderate (10-15 mph)	86	1.8	20	29.1	Routine
	8/25/2014	7:15	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	87	2	5	32.0	Routine
	9/2/2014	7:15	High Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	84	2	20	21.3	Routine
	9/8/2014	7:00	Low Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	17	10	21.2	Routine
	9/15/2014	7:15	Low Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	80	23	5	21.8	Routine
	9/22/2014	7:30	Low Tide		Scattered Clouds	North-Northeast	Light (0-5 mph)	83	2	20	23.0	Routine
	9/29/2014	7:10	Normal		Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	7.8	64	21.6	Routine
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	13	5	29.8	Field Split
	10/21/2014	7:15	Low Tide		Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	74	2	5	29.7	Routine
	10/28/2014	9:56	Normal		Cloudy	South	Moderate-Light (5-10 mph)	75	2	10	29.7	Routine

North Beach

LCNBI

Beach Name North Beach

	4/7/2014	7:00	Low Tide	Falling	Cloudy	Northeast	Moderate-Light (5-10 mph)	62	79	31	3.6	Routine
	4/14/2014	7:00	High Tide	Falling	Cloudy	Southwest	Moderate-Strong (15-20 mph)	68	23	5	1.8	Routine
	4/21/2014	7:05	Low Tide	Falling	Clear	Southeast	Light (0-5 mph)	70	33	10	3.1	Routine
	4/28/2014	7:15	High Tide		Cloudy	South-Southeast	Strong (20-35 mph)	72	1600	504	3.0	Routine
	5/5/2014	7:10	Low Tide		Clear	South-Southwest	Light (0-5 mph)	70	17	10	4.3	Routine
	5/12/2014	7:10	High Tide		Cloudy	South	Moderate-Strong (15-20 mph)	74	17	53	6.7	Routine
	5/19/2014	7:10	Low Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	73	33	31	5.3	Routine
	5/27/2014	7:05	High Tide	Falling	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	75	6.8	5	4.6	Routine
	6/2/2014	7:00	Low Tide	Falling	Partly Cloudy	East-Southeast	Light (0-5 mph)	76	110	42	4.9	Routine
	6/9/2014	7:15	Low Tide	Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	78	49	10	1.5	Routine
	6/16/2014	7:20	Low Tide	Falling	Partly Cloudy	South	Light (0-5 mph)	78	13	20	2.4	Routine
	6/23/2014	7:15	Low Tide	Falling	Cloudy	South-Southwest	Light (0-5 mph)	78	17	5	0.9	Routine
	6/30/2014	7:05	Low Tide	Falling	Clear	South	Light (0-5 mph)	76	240	254	0.9	Routine
	7/7/2014	7:10	Normal		Scattered Clouds	South-Southeast	Light (0-5 mph)	80	1	5	0.7	Routine
	7/7/2014	7:10	Normal		Scattered Clouds	South-Southeast	Light (0-5 mph)	80	1	5	0.7	Field Duplicate

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/14/2014	7:10	Low Tide	Scattered Clouds	Southeast	Light (0-5 mph)	80	240	478	1.8	Routine
	7/21/2014	7:10	Low Tide Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	78	130	75	0.6	Routine
	7/28/2014	7:00	Low Tide	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	79	13	5	0.7	Routine
	8/4/2014	7:05	High Tide Falling	Partly Cloudy	East	Light (0-5 mph)	74	240	192	2.0	Routine
	8/11/2014	7:05	Low Tide Falling	Partly Cloudy	South-Southwest	Light (0-5 mph)	80	23	5	4.2	Routine
	8/18/2014	6:50	High Tide	Partly Cloudy	South-Southwest	Moderate (10-15 mph)	80	4.5	10	4.8	Routine
	8/25/2014	7:00	High Tide Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	80	17	20	5.5	Routine
	9/2/2014	7:00	High Tide Falling	Partly Cloudy	South-Southwest	Light (0-5 mph)	78	33	137	1.6	Routine
	9/8/2014	8:00	High Tide Falling	Clear	Calm	Calm (0 mph)	78	23	10	2.2	Routine
	9/15/2014	7:10	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	79	33	10	3.2	Routine
	9/22/2014	7:10	High Tide Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	76	49	31	5.8	Routine
	9/29/2014	7:00	High Tide Falling	Cloudy	East-Southeast	Light (0-5 mph)	75	23	5	9.4	Routine
	10/20/2014	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	70	350	64	5.5	Routine
	10/28/2014	7:00	High Tide Falling	Cloudy	South-Southeast	Light (0-5 mph)	70	130	20	8.5	Routine

Rutherford Beach*RUTH1**Beach Name Rutherford Beach*

	4/7/2014	7:40	Normal	Cloudy	North	Moderate (10-15 mph)	58	7.8	64	24.8	Routine
	4/14/2014	7:30	Low Tide	Cloudy	South	Moderate (10-15 mph)	71	22	137	26.7	Routine
	4/21/2014	7:35	Normal	Scattered Clouds	Calm	Calm (0 mph)	70	2	5	22.5	Routine
	4/28/2014	7:25	High Tide	Cloudy	South-Southwest	Moderate (10-15 mph)	75	17	192	17.5	Routine
	5/5/2014	7:55	Normal	Scattered Clouds	South	Moderate (10-15 mph)	71	23	10	27.9	Routine
	5/12/2014	7:25	High Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	77	6.8	64	15.1	Routine
	5/19/2014	7:30	High Tide Falling	Scattered Clouds	South-Southeast	Moderate (10-15 mph)	72	46	87	23.5	Routine
	5/27/2014	7:25	Normal	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	78	79	42	8.4	Routine
	5/27/2014	7:25	Normal	Cloudy	South-Southeast	Moderate-Strong (15-20 mph)	78	49	42	8.4	Field Split
	6/2/2014	7:25	High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	80	7.8	99	9.7	Routine
	6/9/2014	7:30	Low Tide Falling	Partly Cloudy	South	Moderate (10-15 mph)	83	2	53	16.4	Routine
	6/16/2014	7:35	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	82	6.8	87	21.3	Routine
	6/23/2014	7:20	Low Tide	Cloudy	South-Southwest	Moderate-Light (5-10 mph)	82	79	42	19.0	Routine
	6/30/2014	7:45	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	81	17	31	22.2	Routine
	7/7/2014	7:35	Low Tide	Scattered Clouds	Calm	Calm (0 mph)	83	1	5	22.3	Routine
	7/14/2014	7:25	Low Tide	Partly Cloudy	Calm	Calm (0 mph)	82	2	2005	24.9	Routine
	7/21/2014	7:15	Low Tide	Light Rain	Calm	Calm (0 mph)	82	11	222	18.8	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type
	7/28/2014	7:20	Low Tide	Scattered Clouds	West	Light (0-5 mph)	83	6.8	53	26.0	Routine
	8/4/2014	7:20	Normal	Scattered Clouds	East-Southeast	Light (0-5 mph)	84	22	124	25.3	Routine
	8/11/2014	7:30	Low Tide	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	85	4.5	5	26.3	Routine
	8/18/2014	7:20	Normal	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	84	4.5	164	27.9	Routine
	8/25/2014	7:15	Low Tide	Partly Cloudy	Calm	Calm (0 mph)	85	2	10	29.6	Routine
	9/2/2014	7:20	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	83	7.8	87	15.5	Routine
	9/8/2014	7:25	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	82	17	20	23.3	Field Split
	9/8/2014	7:25	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	82	17	5	23.3	Routine
	9/15/2014	7:30	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	78	23	42	24.3	Routine
	9/22/2014	7:20	Low Tide	Scattered Clouds	Calm	Calm (0 mph)	79	2	5	19.5	Routine
	9/29/2014	7:15	Low Tide	Cloudy	North-Northeast	Light (0-5 mph)	77	20	20	20.2	Routine
	10/20/2014	7:20	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	71	4.5	10	28.6	Routine
	10/20/2014	7:20	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	71	2	5	28.7	Field Duplicate
	10/28/2014	7:30	Normal	Cloudy	South	Light (0-5 mph)	75	2	53	26.8	Routine

South Beach and Rabbit Island

LCSBI

Beach Name South Beach and Rabbit Island

4/7/2014	7:00	Low Tide	Falling	Cloudy	Northeast	Moderate-Light (5-10 mph)	63	49	10	6.4	Routine
4/14/2014	7:00	High Tide	Falling	Cloudy	Southwest	Moderate-Strong (15-20 mph)	68	17	5	3.9	Routine
4/21/2014	7:05	Low Tide	Falling	Clear	Southeast	Light (0-5 mph)	70	7.8	5	6.0	Routine
4/28/2014	7:15	High Tide		Cloudy	South-Southeast	Strong (20-35 mph)	72	70	254	6.8	Routine
5/5/2014	7:10	Low Tide		Clear	South-Southwest	Light (0-5 mph)	70	11	5	7.3	Routine
5/12/2014	7:10	High Tide		Cloudy	South	Moderate-Strong (15-20 mph)	74	33	31	11.0	Routine
5/19/2014	7:10	Low Tide	Falling	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	73	7.8	10	10.7	Routine
5/27/2014	7:05	High Tide	Falling	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	75	11	10	9.6	Routine
6/2/2014	7:00	Low Tide	Falling	Partly Cloudy	East-Southeast	Light (0-5 mph)	76	49	5	2.1	Routine
6/9/2014	7:15	Low Tide	Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	78	110	20	4.3	Routine
6/16/2014	7:20	Low Tide	Falling	Partly Cloudy	South	Light (0-5 mph)	78	49	5	0.8	Routine
6/23/2014	7:15	Low Tide	Falling	Cloudy	South-Southwest	Light (0-5 mph)	78	17	111	2.4	Routine
6/30/2014	7:05	Low Tide	Falling	Clear	South	Light (0-5 mph)	76	350	99	1.9	Routine
7/7/2014	7:10	Normal		Scattered Clouds	South-Southeast	Light (0-5 mph)	80	1	10	2.0	Routine
7/14/2014	7:10	Low Tide		Scattered Clouds	Southeast	Light (0-5 mph)	80	4.5	10	4.8	Routine
7/21/2014	7:10	Low Tide	Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	78	540	99	2.9	Routine
7/28/2014	7:00	Low Tide		Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	79	2	5	1.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Fecal Coliform	Entero- cocci	Salinity	Sample Type	
	8/4/2014	7:05	High Tide	Falling	Partly Cloudy	East	Light (0-5 mph)	74	350	1298	4.6	Routine
	8/11/2014	7:05	Low Tide	Falling	Partly Cloudy	South-Southwest	Light (0-5 mph)	80	4.5	5	8.8	Routine
	8/18/2014	6:50	High Tide		Partly Cloudy	South-Southwest	Moderate (10-15 mph)	80	49	42	10.3	Routine
	8/18/2014	6:50	High Tide		Partly Cloudy	South-Southwest	Moderate (10-15 mph)	80	33	42	10.3	Field Duplicate
	8/25/2014	7:00	High Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	80	7.8	5	10.3	Routine
	9/2/2014	7:00	High Tide	Falling	Partly Cloudy	South-Southwest	Light (0-5 mph)	78	170	124	3.4	Routine
	9/8/2014	8:00	High Tide	Falling	Clear	Calm	Calm (0 mph)	78	920	20	3.4	Routine
	9/15/2014	7:10	High Tide	Falling	Partly Cloudy	East	Strong (20-35 mph)	79	33	64	5.7	Routine
	9/22/2014	7:10	High Tide	Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	76	23	10	8.8	Routine
	9/29/2014	7:00	High Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	75	11	150	12.2	Routine
	10/20/2014	7:05	High Tide	Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	70	7.8	10	9.7	Routine
	10/28/2014	7:00	High Tide	Falling	Cloudy	South-Southeast	Light (0-5 mph)	70	2	5	14.5	Routine

APPENDIX D

Summary of Louisiana BEACH Program's Fulfillment of U.S. EPA's BEACH Grant Requirements

Summary of Louisiana BEACH Program's Fulfillment of USEPA's BEACH Grant Requirements

USEPA established nine performance criteria that eligible coastal or Great Lakes state, tribal, or local governments must meet to receive grants to implement coastal recreation water monitoring and public notification programs under the BEACH Act. Those criteria, together with a brief summary how Louisiana has fulfilled each, are provided below.

Category	Performance Criterion	Louisiana's Fulfillment of Criterion
Evaluation and Classification	1. Develop risk-based beach evaluation and classification plan	<p>Identification of factors used to evaluate and rank beaches are provided in Chapter 2 of the <i>Louisiana's BEACH Grant Final Report, Grant Year 2001</i> (the "Initial BEACH Report"; LDHH, 2003). More specifically:</p> <ul style="list-style-type: none"> • Coastal recreation waters are identified in Section 2.1. • Beaches used by the public for water contact activities within coastal recreation waters are identified in Section 2.2. • The original information describing (1) the potential risk to human health presented by pathogens and (2) the use of the beaches is provided in Sections 2.3-2.4 of the Initial Report. Information on the prior year's water quality and projected level of use for each beach monitored under the Program are provided in Chapter 2 of the Program's annual report. • EPA is notified annually of any change in beach rankings and other program changes in Chapter 2 of the Program's annual report.
Monitoring	2. Develop tiered monitoring plan	<ul style="list-style-type: none"> • Chapter 3 of the Initial BEACH Report describes the Program's monitoring plan, addressing the frequency and location of monitoring, and assessment criteria. • Chapter 2 of the Initial BEACH Report describes periods of recreational use of the waters, and nature and extent of use during certain periods. • Sample stations were established based on spatial use patterns as described in Chapter 2 of the Initial BEACH Report, adjusted for the proximity to known point and nonpoint sources of pollution. • Section 3.1 of the Initial BEACH Report outlines the Program's quality control plan, which is described more completely in the Program's current Quality Assurance Project Plan (QAPP).
	3. Monitoring report submission and delegation	The Program reports monitoring data to the public, EPA, and other agencies through timely annual submission of those data to EPA's STORET database. Additionally, the full dataset and summaries are provided in the Program's Annual Report.

	4. Methods and assessment procedures	Methods for detecting levels of pathogen indicators in coastal recreation areas are described in Section 3.3 of the Initial BEACH Report and the QAPP.
Public Notification and Prompt Risk Communication	5. Public notification and risk communication plan	Measures to notify the public, EPA and local governments when indicator bacteria levels exceed a water quality standard are provided in Chapter 4 of the Initial BEACH Report.
	6. Measures to notify EPA and local governments	Measures to notify local governments and EPA when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. The Program submits notification data and actions taken to notify the public to EPA's PRAWN database annually.
	7. Measures to notify the public	Measures to notify the public when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. Upon observing an exceedance of water quality criteria, the Program immediately issues a public notification or resamples for bacterial exceedance of a water quality standard in accordance with the QAPP. The notification is placed on the Program's website, disseminated to the media, and signs posted at each station are changed to indicate that an advisory is in effect.
	8. Notification report submission and delegation	<ul style="list-style-type: none"> • EPA and local governments are notified annually of any notification plan changes and any delegation of responsibilities in the Program's annual work plan. • The Program reports actions taken to notify the public when water quality standards are exceeded in its annual PRAWN submission and in the Program's annual report.
Public Evaluation	9. Public evaluation of program	The Initial Beach Report and all subsequent annual reports have been made available to the public for review and comment. The Program publishes a public notice informing the public of the availability of the annual report and the duration of the comment period, and the report is made available on the Program's website.